

General Comment Midway Colony Mar. 21, 452

Comparative Position of Species Mar. 25, 460

Attack Behavior With "trembling" movements, Mar. 22, 456

Alarm Posture Mar. 18, 447.

Behavior of Juveniles FB + HVH, Mar. 17, 445; Mar. 23, 457.

"FB" Notes as obviously hostile reaction; Mar. 18, 447.

Nodding Best general comment, Mar. 25, 460, general description, Mar. 17, 446; Mar. 18, 447, Mar. 19, 448, Mar. 21, 455; Mar. 22, 456. Differences between high intensity and low intensity forms of N, Mar. 19, 448. Less aggressive forms of N, Mar. 19, 448. Comparison with Brown Noddy, the N of the Black species being less extremely up-and-down, Mar. 17, 446

G, Description, Mar. 17, 446, Mar. 18, 447

V, Description, Mar. 18, 447. "Egg-shape" Head-set, description & sketch, Mar. 20, 450, 451. Sketch V+G, Mar. 18, 447. Comparatively large number of V+G's without tongue-raising, Mar. 21, 450, 452.

Post, Description, Mar. 18, 447, sketches, Mar. 18, 447

HFK Mar. 18, 447.



General Comment, CR - SCW - LSCW - LCWN Complex. Mar. 18, 447, Mar. 19, 449, Mar. 20, 450; best comment, Mar. 21, 453, 454.

LCWN General comment & description, Mar. 17, 445; Mar. 19, 449, Mar. 20, 449, Mar. 21, 453, 454; Mar. 22, 456; Apr. 9, 467. Difference between aerial and non-aerial LCWN's, Mar. 22, 456. Peculiarly nasal notes, Mar. 17, 446. With tongue-raising, Mar. 17, 445. Diving up-phase of N, Mar. 21, 455, 456. Most common reaction of birds on ground or in trees toward flying birds, Mar. 17, 446, Mar. 18, 446. Pot. pred. reaction, Mar. 18, 446. Unusual note by birds flying up in silent panic, Mar. 18, 446.

SCW - LSCW. Description, Mar. 17, 445, Mar. 18, 447, Mar. 19, 449, Mar. 20, 449, Mar. 21, 454. Aggressiveness, Mar. 19, 448. SCW - LCWN as landing call, Mar. 17, 445, Mar. 21, 453. Relationship LSCW - LCWN, Mar. 21, 450.

CR. Description, Mar. 17, 446, Mar. 19, 448, 449, Mar. 20, 449, 450, Mar. 21, 450, 452, 455. General discussion, Mar. 19, 449, 450, Mar. 20, 450. Aggressiveness, Mar. 21, 454. Relationship to LCWN, Mar. 21, 450. As landing call with O posture, description & sketch, Mar. 22, 456, Mar. 23, 460. CR with N, Mar. 23, 459.

Mobile Pairing Mar. 21, 454, Mar. 22, 456, 459.



Wandering Flights. Mar. 23, 459.

M.C. Descriptions; Mar. 17, 448; Mar. 20, 450; Mar. 21, 454; Mar. 24, 459. Apparent absence of circular parading in L; Mar. 24, 459. Billing during N; Mar. 20, 450. Changes as pairing progresses; Mar. 25, 460.

Mutual Preening. Best description; Mar. 27, 461. Associated with M.C.; Mar. 20, 450; with billing; Mar. 22, 455. Confined to pre-incubation phase?; Mar. 21, 452. Relationship between mutual and self-preening; Mar. 21, 455.

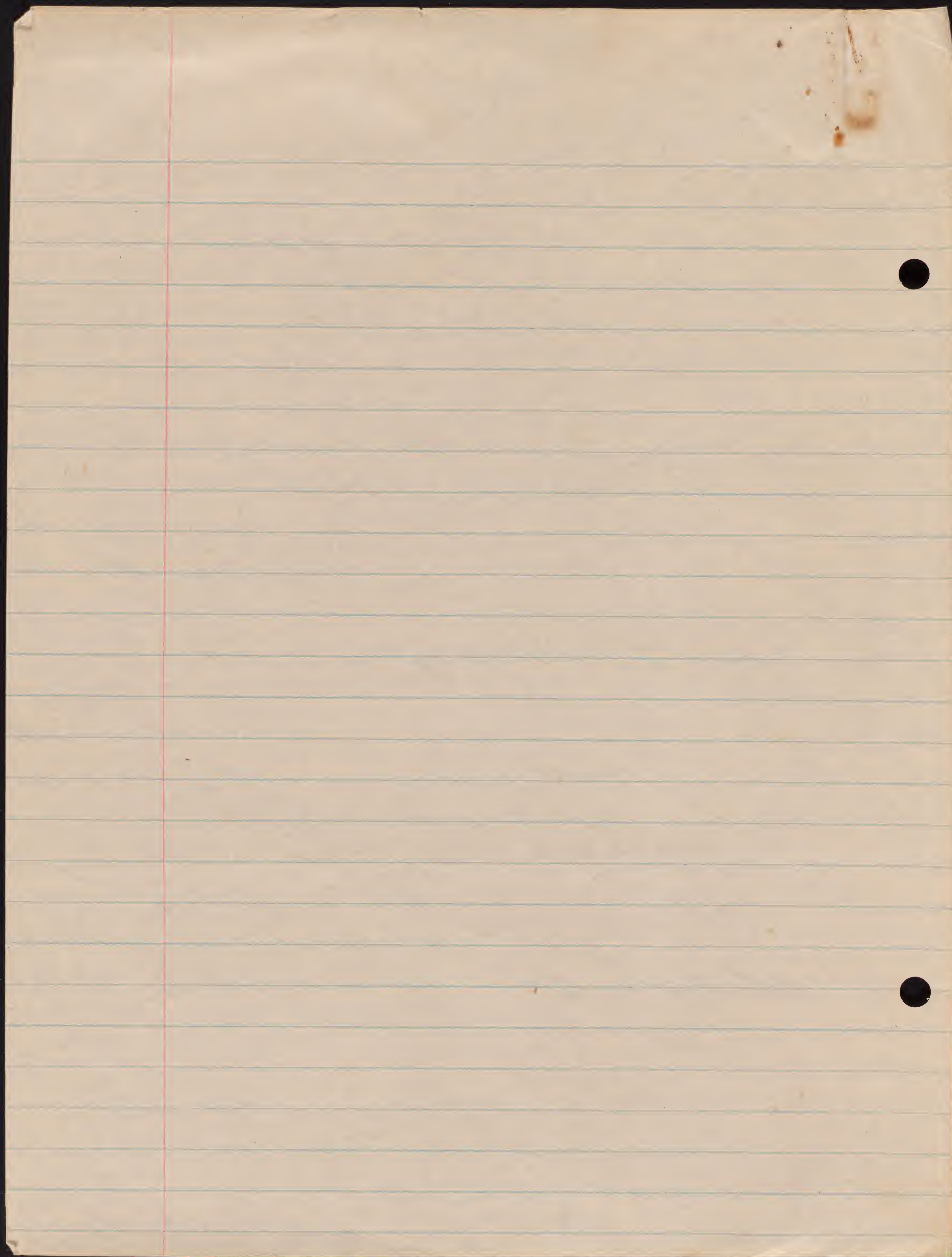
Late Pairing Behavior. General comment; Mar. 27, 462. Mutual preening - M.C. - n.m. collecting complex; Mar. 20, 450.

Feeding ♀ Apparently quite silent; Mar. 23, 459.

Nest-Building Mar. 23, 460; Mar. 27, 462.

High Flight. Description; Mar. 17, 446; Mar. 18, 447. Not connected with pairing; Mar. 24, 460.







*Larus serranus*. INDEX, 1955.

Physical description of the birds Nov. 20, 112; Dec. 13, 188; Dec. 14, 189.

Sketch of wing pattern, XIX.

General Notes 300 birds, Nov. 20, 110. Colony at the Laguna del Maule, Dec. 13, 187; Dec. 14, 190.

General comment on voice Nov. 20, 111; Dec. 13, 187, 188.

Circling. Description, Dec. 13, 188. With LCN's, Dec. 13, 188.

Silent Panic Dec. 15, 196.

Erratic Flight Nothing like Bonaparte's Gull, Dec. 13, 188.

Pursuit Flight General description; Dec. 13, 189, Dec. 14, 192, 193; Dec. 15, 197. With attack by pursuer, Dec. 15, 197. Including swoop & loar, Dec. 14, 193. With long LCN's, Dec. 13, 188. As redirection activity, after disputes in colony, Dec. 14, 193.

Swoop & Loar Description, during circling, apparently redirected in vacuo; Dec. 13, 188; Dec. 14, 191, 192. As part of pursuit flights, Dec. 14, 192. Description of extreme swoops & loars, Dec. 14, 192. "Flying" loars, Dec. 14, 193. Peculiarities due (?) to high wind, Dec. 14, 192. Shuttles; Dec. 14, 192, XIX, swoop with long LCN's, Dec. 13, 188. Swoop with "PC", Dec. 14, 191. Description of swoop & loar with complete L.C., Dec. 15, 196.

Aerial fight. Like swoop, rise, and hover of Franklin's Gull, but no glide, Dec. 15, 197.

General comment on wing-beats during aerial hostility. Extreme when wind is strong, Dec. 14, 197. Less extreme when wind is weak, Dec. 15, 195.

Aerial calls. Description, short LCN's, Dec. 13, 188. Short notes given



by birds flying past me, Dec. 13, 187; by birds circling me, Dec. 13, 188. Description, long LCN's, Dec. 13, 187. Long notes given by birds circling me, Dec. 13, 188; by pursuer during pursuit flight, Dec. 13, 188; during swoop, Dec. 13, 188. Long series of long LCN's; Dec. 13, 188; Dec. 14, 191. LCN's in head-down posture, sketch, Dec. 15, 195, 196. LCN's by immatures; Dec. 13, 188, <sup>Dec. 14, 189</sup> Dec. 15, 198. General analysis of aerial LCN's, short notes, long notes, & "PCC" notes, including description & causal analysis, Dec. 14, 190, 191. Notes intermediate between LCN's and Al C. notes, Dec. 14, 191.

Aerial L.C. With swoop & soar, description, Dec. 15, 196.

Al.C. Description, flying wild birds; Dec. 13, 187; Dec. 14, 191; Dec. 15, 196. Description, wild birds on ground, Dec. 13, 187. General comment, Dec. 14, 191. Intermediates between Al C. notes and LCN's, flying wild birds, Dec. 14, 191.

V. Description, wild birds, Dec. 13, 187; Dec. 14, 189, 193. With tail above wings, wild bird, Dec. 14, 193. Sketches, wild birds; Dec. 13, 187; agg. V, wild bird; Dec. 15, 197; ~~XXIV~~; V + LCN, wild bird, ~~XX~~, ~~XXIV~~. General comment on circumstances in which V occurs in colony; Dec. 14, 193; Dec. 15, 196. Wild birds, V before attack, Dec. 14, 189. Wild birds, V + brief LCN's before attack; Dec. 13, 187; Dec. 14, 189. Wild birds, V + HF after attack, Dec. 14, 189. Extreme agg. V by wild immature, Dec. 14, 189. Zoo-bird, circumstances, after L.C., Nov. 20, 110; Nov. 21, 112.

Posture intermediate between V and Ch Description, Dec. 14, 194; Dec. 15, 196, 197. Sketch, Dec. 14, 194.

HF. Description, wild birds, Dec. 13, 187; Dec. 14, 194. With V, posture intermediate between V + Ch, Ch, Dec. 14, 194. Circumstances,



wild birds; Dec. 13, 187, Dec. 14, 193, 194; Dec. 15, 196.

U+HF, by wild birds after attack, Dec. 14, 189

R. Zoo bird, with F, Nov. 20, 111, Nov. 23, 116; sketch, ~~XX~~.  
Zoo bird, with H, Nov. 20, 111, 112. Zoo bird, with LCN or FB  
note, Nov. 20, 112; Nov. 21, 112. Zoo bird, sketch with U+LCN,  
~~XX~~. Zoo bird, R obviously aggressive, Nov. 20, 112. Zoo bird,  
R as a simple pre-flight int. mov., Nov. 20, 112. R by wild bird,  
Dec. 14, 189. Immature wild bird, R+H (possibly semi-F)  
before attack, Dec. 14, 189

H. Zoo bird. Some H's obviously aggressive, some with R, some apparently  
transitional to semi-F or F, Nov. 20, 112.

Ground LCN. Description, wild birds, Dec. 13, 187. Zoo bird, in O  
posture, with "inverted arch", Nov. 21, 112. Zoo bird, sketch of  
U+LCN, ~~XX~~, ~~XXIV~~. Circumstances, wild birds, Dec. 13, 187.  
Wild birds, U+brief LCN's before attack, Dec. 13, 187; Dec. 14,  
189.

Notes possibly intermediate between LCN's & FB notes. (Probably  
really LCN's). Zoo bird, with int. movs. of H, Nov. 20, 110, 112;  
Nov. 21, 112; with R, Nov. 20, 112; Nov. 21, 112.

Complete L.C. performance on the ground. Description of call & post-  
ures, zoo bird, Nov. 20, 111, Nov. 21, 112, 113; Nov. 23, 116. Descript-  
ion, wild birds, Dec. 13, 187. Circumstances, wild birds, Dec. 14,  
193, 194; Dec. 15, 196. General comment on the implications of the rar-  
ity of the L.C. performance, Dec. 14, 195. Description of O posture,  
zoo bird, Nov. 20, 111, Nov. 21, 112; Nov. 23, 116; wild birds, Dec.  
14, 193; Dec. 15, 197. Sketches of O, Dec. 14, 193; ~~XX~~. Description of  
F posture, zoo bird, Nov. 20, 111; Nov. 23, 116; wild birds, Dec. 14,



193. F with tail above wings, tail spread, Dec. 15, 197. Sketches of F, Dec. 14, 193; XIX

Chokung. Description of posture & notes; zoo bird; Nov. 20, 111; Nov. 23, 116; wild birds; Dec. 14, 194. Tail above wings, not spread, Dec. 14, 194. Circumstances in colony; Dec. 14, 194; Dec. 15, 196. As part of greeting; wild birds; Dec. 14, 194; Dec. 15, 196. Zoo bird, aggressive toward me, Nov. 20, 111. Has Chokung partly "take the place" of the L.C. performance (?), Dec. 14, 195.

PAG. Zoo bird, in association with Chokung, Nov. 20, 111.

Example of series of threat & appeasement displays on ground, presumably exemplifying gradual decline of intensity. Dec. 15, 196.

FB note & HB. Zoo bird, from U, Nov. 23, 116

♀ FB from ♂. Wild birds, Dec. 14, 194.

♂ Regurge. Wild birds, Dec. 14, 194.

Redirected ♂ hostility as reaction to ♀ FB. Dec. 14, 194.

♂ HB before Copulation int. movs. Dec. 14, 195.

Cop. Call. Dec. 14, 195.

*Catharacta skua chilensis*. INDEX, 1956.

A few brief notes, Jan. 3, 228, 229. Including:

Physical description of the birds. Various forms of violent aerial hostility, probably unritualized. Aerial L.C.. Aerial Al.C., description, and a discussion of the phylogenetic implications thereof.



*Larus maculipennis*. INDEX, 1955-56.

General Notes. Dec. 24, 202.

Physical description of the birds. Dec. 24, 203; Dec. 25, 206. Sketches of wing pattern, XXV.

General comment on voice. Dec. 25, 204, 205.

General comment on phylogenetic position. Dec. 24, 203.

Circling. With LCN's, al. C's, and "PCC" notes, Dec. 30, 220. With swoops & soars; Dec. 30, 221; Jan. 6, 235.

Permit Flight. Description, Dec. 27, 209. With LCN's and attack call notes, Dec. 27, 209. Including swoops & soars, Dec. 27, 209.

Swoop & Soar. As part of permit flight, with attack call during swoop, LCN - silence during soar, Dec. 27, 209. Shallow, with circling, sometimes redirected in vain, Dec. 30, 221. Mod. steep, with circling, sometimes redirected in vain, Jan. 6, 235. Extreme, toward Shua, Dec. 30, 220. Less extreme, silent, toward Shua, Dec. 31, 224. Shallow swoops; with long LCN's, Jan. 6, 235; with LCN's or weak "PCC" notes, Dec. 30, 221; with strong "PCC" notes, Dec. 30, 221; with al. C. - attack call, Dec. 30, 221.

Aerial LCN. Description, Dec. 24, 202, 203; Dec. 25, 204; Dec. 31, 224.

Buzziest or loudest LCN's by non-nuptial adults and immatures, Dec. 30, 221. Long LCN's, Dec. 31, 223, 224. "PCC" (largely aerial, at least), description, Dec. 25, 205. General discussion of the relationship between "PCC" and LCN's, Dec. 31, 223. Rapid series of LCN's, Dec. 30, 221. Circumstances of LCN's, with aerial O's, Dec. 31, 223, 224; Jan. 2, 229; Jan. 6, 236; as part of permit flight, Dec. 27, 209; by landing bird, Jan. 6, 236; "PCC" with circling, Dec. 30, 220.



Aerial L.C., absent in this species (?), Jan. 2, 229.

Aerial Posture Sketch, Dec. 31, 223. Coming in to land, sketch, Jan. 6, 236. With long LCN's, Dec. 31, 223, 224; Jan. 6, 236. With short LCN's, and a discussion of the implications thereof, Jan. 2, 229.

Landing Call. Description, Dec. 25, 205; Dec. 31, 224. Not always present, Dec. 25, 207.

Al. C. Description, Dec. 25, 204, 208; Dec. 29, 216. With swoops, and a discussion of the implications thereof, Dec. 30, 221.

Attack Call. Description, Dec. 25, 206, 208. As part of pursuit flight, Dec. 27, 209. During swoops, Dec. 30, 221.

U. Description, Dec. 25, 206. Agg. U, description, Dec. 24, 203; Jan. 2, 230; Sketches, ~~XXV~~. Aux. U, description, Dec. 24, 203. U before attack, Jan. 2, 230. U+HF after attack, Dec. 25, 204. U+HF as M.C. or part of M.C.; Dec. 25, 205; Dec. 27, 209; Dec. 29, 216; Dec. 30, 220; Dec. 31, 224; Jan. 6, 236.

Posture intermediate between U and Ch. Description, Dec. 25, 207. Sketch, Dec. 25, 207.

HF. U+HF after attack, Dec. 25, 204. U+HF as M.C. or part of M.C.; Dec. 25, 205; Dec. 27, 209; Dec. 29, 216; Dec. 30, 220; Dec. 31, 224; Jan. 6, 236. F+HF as part of M.C., Dec. 31, 224.

H. Description, Dec. 25, 209. H+R, Dec. 25, 208. Obviously hostile, Dec. 25, 208.

T. Description, Dec. 25, 204. Circumstances, Dec. 24, 203; Dec. 25, 204; Dec. 31, 224. Obviously containing a hostile component, Dec. 24, 203.

HB. Circumstances, Dec. 24, 203; Dec. 25, 204; Dec. 31, 224. Obviously containing a hostile component, Dec. 24, 203; Dec. 25, 208. HB as a di-



agnostic feature of the *ridibundus* group, Dec. 24, 203

"FB" note Description, Dec. 25, 205. Obviously hostile nature, Dec. 25, 208.

R. With H, Dec. 25, 208. With semi-H, semi-F, Dec. 25, 206. With F, Dec. 25, 205.

PAG. Description, Dec. 25, 207.

Extraneous activities Developing from PAG, Dec. 25, 207.

Ground LCN. Description, Dec. 24, 202. Before attack, Dec. 25, 207.

Complete L.C. performance on the ground. General description of calls &

postures, Dec. 24, 203, Dec. 25, 204, 205, 208, 209, Dec. 31, 224.

As part of M.C.; Dec. 25, 205, Dec. 27, 209, Dec. 29, 216, Dec. 30, 220, Dec. 31, 224, Jan. 6, 236. Fly lands on ground toward flying birds, Dec. 30, 220.

O posture. Description, Dec. 24, 203, Dec. 25, 204, 205, 206, 207. Sketches; Dec. 25, 205, 207. With single note, Dec. 25, 204. Before attack; Dec. 25, 204, 206, 207; Jan. 2, 230. Description of O's before attack, Dec. 25, 206.

F posture. Description; Dec. 24, 203, Dec. 25, 204, 206, 208, 209, Dec. 29, 216. Description of F notes, Dec. 25, 204, 205, 208, 209. F's before attack, Dec. 25, 204. F+HF as part of M.C., Dec. 31, 224. F+R, Dec. 25, 208. Semi-F, semi-H postures, with & without R, Dec. 25, 206.

Choking Description, Dec. 25, 208. Sketches; Dec. 25, 208, Jan. 2, 230.

With M note, Jan. 2, 230. Discussion, Jan. 2, 230.

M.C. Description, O → F → U+HF type, Dec. 25, 205, Dec. 27, 209, Dec. 29, 216, Dec. 30, 220, Dec. 31, 224, Jan. 6, 236. U+HF type, Dec. 27, 209, Dec. 31, 224.



M. By ♂, after M.C., description, Dec. 27, 210.

Paving behavior ♂ visited by several ♀'s, Dec. 29, 215. ♂ visiting several ♀'s, Jan. 4, 236.

Mutual FB between ♂ and ♀ ♂ T from H, and HB; ♀ T from H, Dec. 31, 224.

*Sterna hirundinacea*. INDEX, 1955-56

A very few brief remarks.

"Tik" Notes Al.C. notes (?), Jan. 3, 231.

Swoop & Loar at Skua, description, Dec. 31, 226.

"Keeee-aaar" Notes By birds flying over a potential predator in the colony, Jan. 3, 230. From aerial O posture, Jan. 3, 231. From a semi-U posture on ground, Jan. 3, 231.

"Ka ka ka ha..." Call In air, Dec. 31, 226. By fish-carrier during Fish Flights, Jan. 3, 231. With St. on ground, Dec. 31, 225.

St. Description, sketch, Dec. 31, 225.

U. Description, sketch, Dec. 31, 225.

Tilt With U, as part of M.C., Dec. 31, 225.

HF. With U, as part of M.C., Dec. 31, 225.

M.C. St → U + Tilt + (sometimes) HF, Dec. 31, 225.

Beugertelling. Jan. 3, 230.

Scoping. Description, sketch, Dec. 31, 226. Comparison with Glik of Franklin's Gull, Dec. 31, 226.

General comparison between "Keeee-aaar" of *Sterna* and Rasp of *Larosterna*, and between "Ka ka ka ha..." of *Sterna* and Clt of *Larosterna*.  
Jan. 3, 231.



# Larus furcatus. INDEX, 1955.

- ✓ General Note Oct. 24, 12
- ✓ Swoop and Soar Toward us, apparently unmutualized, Whistles during swoops, Oct. 24, 15.
- ✓ Alarm Posture Description, Oct. 24, 12.
- ✓ Gaping Description, toward us, Oct. 24, 12.
- ✓ OCB When alarmed, Oct. 24, 14.
- ✓ Side-to-side head-turning. Relatively slow, when alarmed, Oct. 24, 14.
- ✓ Side-to-side head-shake. Rapid, when alarmed, Oct. 24, 14.
- ✓ Ticking Description of call, Oct. 24, 12, 13; diagrams, Oct. 24, 12. Circumstances, mostly toward us, Oct. 24, 13. In semi-O posture, Oct. 24, 12. In breast-down posture, sketch, Oct. 24, 13. By flying birds, sketch, Oct. 24, 14. Discussion, Oct. 24, 12, 13. Related to A.C. or L.C. of other species (?), Oct. 24, 12. Connection with Whistle, Oct. 24, 12, 13.
- ✓ Whistle Description of call, diagrams, Oct. 24, 13. Circumstances; toward mate, Oct. 24, 13; toward me, Oct. 24, 13. In semi-O posture, Oct. 24, 13, 14. Soft whistle by bird on ground toward flying birds, Oct. 24, 13; in extremely low, diagonal O, sketch, Oct. 24, 14. Ordinary Whistles by flying birds, Oct. 24, 14; longer, quavering Whistles by flying birds, Oct. 24, 14, 15. Sketches of postures from which Whistles are given by flying birds, Oct. 24, 14. Whistles with swoops, Oct. 24, 15. Connection of Whistles with Ticking, Oct. 24, 12, 13.
- ✓ Semi-O posture sketch, V.
- ✓ Choking (?) Description, Oct. 24, 14.



# *Larus fuliginosus.* INDEX, 1955.

General notes Oct. 23, 19.

Physical description of the birds Oct. 24, 16, 18, 19. Sketch, Oct. 24, 19.

General comment on voice. Oct. 24, 17.

General comment on phylogenetic position. Oct. 25, 20

Aerial escape Unritualized, Oct. 25, 19.

Aerial attack Unritualized, Oct. 25, 19. Redirected, Oct. 25, 17.

Pursuit flights Simple, Oct. 24, 18.

Swoop & Soar Toward pot. pred., apparently unritualized, with "PCC" notes, Oct. 24, 18. Toward pot. pred., unritualized, sometimes redirected, Oct. 25, 19. With staccato LCN at nadir of swoop, Oct. 25, 19.

Circling With and without up-and-down movements, unritualized, Oct. 25, 19.

General comment on aerial hostility Reminiscent of King-bird, as far as movements & postures are concerned, Oct. 25, 19.

A.C. By flying birds, description; Oct. 24, 18; Oct. 25, 20.

LCN. General description, Oct. 24, 17. LCN of immature like that of adult, Oct. 25, 19. Description of LCN's by flying birds, Oct. 24, 18.

"PCC" type during swoop, Oct. 24, 18; discussion, Oct. 25, 19.

Staccato LCN, almost "Attack Call", at nadir of swoop, Oct. 25, 19. LCN's before flying up to attack, Oct. 25, 20. Dist. movs.

with LCN's on ground, Oct. 25, 20. LCN's as part of M.C., Oct. 24, 17; Oct. 25, 20. General discussion, some LCN's apparently produced by relatively strong motivation, the LCN's may have partly "taken the place" of the L.C. in this species, Oct. 25, 20.

Juv. LCN. Description, Oct. 24, 18.



Complete L.C. performance on the ground. General description;

Oct. 24, 16, 17, 18; Oct. 25, 20. L.C. without high O or "Ticking";

Oct. 25, 19. L.C. possibly given by immature. Circumstances;

apparently purely hostile, Oct. 24, 17; as part of M.C., Oct. 24, 17,

18; by bird on ground toward flying bird, Oct. 25, 19. Posture;

description, Oct. 24, 16; sketches, Oct. 24, 16, VII. L posture, sketch,

VII. "F" posture, sketches, Oct. 24, 16, VII.

T. After L.C., description & discussion, Oct. 24, 17. From H+R, after attack, Oct. 24, 18. Apparently as part of FB, from H, Oct. 24, 17.

H. With R, during dispute, sketch, Oct. 24, 16. With R+T, after attack, Oct. 24, 18. As part of apparent FB, Oct. 24, 17.

R. With H, during dispute, sketch, Oct. 24, 16. With H+T, after attack, Oct. 24, 18.

U+HF. Weak forms M.C. or part of M.C.; Oct. 24, 17, 18; Oct. 25, 20.

M.C. "Complete", O → L → "F" → U+HF type, Oct. 24, 17, 18.

With Cpr, Oct. 24, 18. "Incomplete", LCN's in semi-O alone;

Oct. 24, 17; Oct. 25, 20; weak U's & HF's alone, Oct. 25, 20.

Cpr. As part of M.C., Oct. 24, 18.

FB. Adults, mutual T from H, Oct. 24, 17. Juveniles, T's from H, Oct. 25, 20.

Defense of pairing territory? Oct. 25, 20.



*Larus dominicanus.* INDEX, 1955-56.

General Notes. Nov. 20, 108; Dec. 1, 164; Dec. 5, 183; Dec. 18, 198;  
Dec. 24, 202

Physical description of the birds. Dec. 1, 164; Dec. 5, 183; Dec. 6, 185;  
Jan. 3+5, 232. Sketch wing-pattern, Dec. 1, 164.

General comment on voice. Dec. 1, 164; Dec. 5, 184; Dec. 6, 185.

General comment on hostile behavior of immatures of all species. Dec. 1,  
164.

Circling. Dec. 24, 202.

Pursuit Flight. Description, twisting & turning, LCN's, plus unritu-  
alized swoop-soar patterns, Dec. 30, 220. With L.C.'s, Dec. 30, 220.

Swoop and Soar. General description, Dec. 30, 220. Flight, unritualized,  
swoop (+ LCN's), soar (silent), redirected in vacuo, Dec. 24, 202.

Aerial LCN. Description, Dec. 1, 165. During swoop, Dec. 24, 202.

Juv. LCN. By flying birds, description, Dec. 1, 165.

Aerial L.C. General description; Dec. 30, 220; Jan. 3+5, 232. Common  
when birds disturbed by me, Dec. 28+29, 215. With aerial O post-  
ure alone, description, Dec. 24, 202. With HD-O postures, description,  
Dec. 28+29, 215. Sketch, aerial O posture, Jan 3+5, 232. L.C.'s  
during pursuit flights, without any ritualized postures at all,  
Dec. 30, 220. Aerial L.C. by immature, Dec. 30, 219.

Al.C. Relatively rare in this species, usually 4-syllables. A few very  
rare 5-syllable calls, Jan 3+5, 233.

Simple attack. Description, (without gaping, and the implications thereof),  
Dec. 4, 180.

V. Description; Dec. 1, 165; Dec. 4, 180; Dec. 5, 183; 300 birds, Dec. 18,



dominicanus. INDEX, 1955-56

199-200; Dec. 21, 201. Sketches; Dec. 5, 183; Dec. 18, 200, XXVI. Circumstances; Dec. 4, 180. High-intensity form, before & after attack or charge, with wings raised; Dec. 5, 183; 300 birds, Dec. 18, 200. U+HF as part of M.C.; Dec. 1, 164. Agg. V. & M notes, Jan 3 & 5, 232.

HF. U+HF as part of M.C.; Dec. 1, 164.

Post. Hostile; Dec. 5, 183; 300 birds, Dec. 21, 201. Int. movs. of HD (?), Dec. 5, 184. Sketch, XXVI.

Ground LCN. Description, sound & postures, Dec. 1, 165.

Complete L.C. performance on the ground. Description, call & postures; Dec. 1, 165; Dec. 5, 184; Dec. 6, 185; 300 birds, Dec. 18, 199. HD-O by 300 bird, adult, with voice like Herring Gull, Nov. 20, 108. Complete L.C. by immature 300 bird, with "pure" voice like that of Herring Gull, Dec. 21, 201. Circumstances; common during high-intensity disputes; 300 birds, Dec. 18, 199, as apparently "pure" hostility, Dec. 1, 165; by bird on ground toward flying bird, as prelim. to M.C.; Dec. 1, 164, 165. Connection with M, 300 birds, Dec. 21, 201; HD-O-M sequences, 300 birds, Dec. 21, 201.

HD. Description; Dec. 1, 165; Dec. 5, 184; 300 birds, Dec. 18, 198, 199. Resemblance of HD notes to M notes; Dec. 31, 226; 300 birds, Dec. 18, 198. HD with typical M note, 300 bird, Dec. 21, 201.

"L" posture, with O notes, description & sketch, Dec. 5, 184.

O. Description; Dec. 1, 165; Dec. 5, 184; 300 birds, Dec. 18, 198, 199; Dec. 21, 201. Extremely polyyllabic O calls, Jan 3 & 5, 232; 300 birds, Dec. 21, 201. Juvs. O posture with peculiar call, Dec. 5, 184.

Extraneous activities. Preening developing from HD, Dec. 5, 184.

M. Description; Dec. 1, 165; Jan 3 & 5, 233; 300 birds, Nov. 21, 114; Dec. 18, 198. M notes by ♀'s (?), 300 birds, Dec. 18, 200. Circumstances, common during disputes in which mate is present; 300 birds, Dec. 18, 199. "Friendly" M; Dec. 1, 165; 300 birds, Nov. 22, 114; Dec. 18, 198. "Friendly" M as a redirection activity, provoked by hostility with neighbors, 300 birds, Dec. 18, 198, 199. 300 birds giving M notes.



(16)

dominicanus. INDEX, 1955-56

when expecting food from visitors, Dec. 18, 200. "friendly" M + Ch apparently used by ♂ to call ♀ to potential nest-site, 300 birds, Dec. 18, 200. General discussion "friendly" M + Ch, Dec. 18, 199. Possibly purely hostile M, 300 birds; Nov. 21, 114. Obviously hostile M's, mate far away or absent. M notes from agg. U, obviously hostile, Jan 3 + 5, 232.

M notes in air, description, Dec. 1, 165. In air, associated with LCN's, obviously not purely sexual, Dec. 6, 185.

Discussion of connection between M + Ch, Dec. 18, 199.

Discussion of connection between M + L.C. performance, 300 birds, Dec. 21, 201. HD with M notes, 300 birds, Dec. 21, 201. HD → O → M sequences, 300 birds, Dec. 21, 201. Discussion of connection between M and HD notes; Dec. 31, 226; 300 birds, Dec. 18, 198; Dec. 21, 201.

Chasing. Description, 300 birds, Dec. 18, 198, 199, apparently silent; 300 birds; Nov. 21, 114; Dec. 18, 198. Circumstances, common during high intensity disputes, 300 birds, Dec. 18, 199, "friendly" Ch. as redirection activity, provoked by hostilities with neighbors, 300 birds, Dec. 18, 198; apparently purely "friendly", 300 birds; Nov. 22, 114; Dec. 18, 198, possibly purely hostile, 300 birds, Nov. 21, 114. Discussion of the connection between M and Ch, Dec. 18, 199.

General discussion of "friendly" M and Ch, Dec. 18, 199.

"Gras-pulling" Possible example, 300 bird, Nov. 21, 114.

T. Description, movements & notes; Dec. 1, 165; Dec. 4, 180; 300 birds, Nov. 22, 115; Dec. 18, 199, 200, <sup>Sketches, XXVI</sup> Peculiar T notes, from U, 300-birds, Dec. 18, 199. T-HD after attack, Dec. 6, 185. Mutual T-wing before copulation attempts; Dec. 4, 180; Dec. 6, 185. T's by immatures, 300 birds, in obviously hostile situations, Dec. 21, 201. T's by juveniles, wild birds, from relaxed posture, semi-H, or H, obviously hostile, not connected with FB, are very reminiscent of the behavior of adult Dolphin gulls, Jan 3 + 5, 232.

FB. Essentially T-wing and nothing more. Possibly sexual, 300 bird, Nov.



dominicanus. INDEX, 1955-56.

- 22, 115. Almost certainly sexual, wild birds, Dec. 1, 1965.  
Pairing behavior. Aerial "visiting", like Herring Gulls in Va.,  
description, Dec. 1, 1964.  
M.C. U+HF type, Dec. 1, 1964. Bird on ground doing L.C. toward water  
before the latter lands, Dec. 1, 1964.  
Copulation Description, Dec. 4, 1960. Cop. Call, 300 birds, description,  
Dec. 18, 200.

pipixcan. INDEX, 1955-56

- Juvenile LCN In air, like birds at Delta, Nov. 16, 1961. On ground,  
in semi-U with slight R, description & sketch, Nov. 16, 1961.  
Generally great activity at beginning of migration. Pairing?,  
Mar. 16, 308.  
Extreme Erratic Flights Description, Mar. 16, 309.  
Long Call Performances. Without subsequent T's, Mar. 21, 321.

atricilla. INDEX, 1955-56

- Juvenile LCN Usual type, Sept. 25, 1.  
Juvenile Pursuit Flight Quite unritualized, Sept. 25, 1.  
Adult Al C. Hooded gull type, Sept. 25, 1.  
General Comment on Voice Quite remarkably like Franklin's  
Gull, April 3, 327.



Larus modestus. INDEX, 1955

## GENERAL

General Comment Oct. 9, 6; Nov. 20, 109; Nov. 24, 118; Nov. 25, 129; Nov. 26, 131, 139; Dec. 1, 157; Dec. 6, 186.

Physical Description of the birds Nov. 25, 121, 124, 126; Nov. 26, 132; Nov. 27, 141.

Sketches, III.  
General Comment on hostility. Appears to be relatively weak, although the birds are by no means phlegmatic; Dec. 1, 157; Dec. 2, 171.

Territoriality General remarks; Dec. 1, 157; Dec. 4, 176.

Ornamentation of displays in general Perfectly conventional; Nov. 27, 146.

General comments on phylogenetic position & evolution Nov. 25, 122, 127; Nov. 28, 152.

General Comment on voices of Laridae Nov. 26, 136.

## YOUNG BIRDS

General Comment on immatures All the young birds at Autofogasta apparently mated; Nov. 27, 141.

Juvenile LCN Description, Oct. 9, 6.

Aerial L.C. Much like that of adults; Dec. 3, 172.

L.C. on ground Much like that of adults; Nov. 27, 141.

Juvenile O posture Sketches, Oct. 9, 6.

I. By juvs. toward adults, Oct. 9, 6. Description of note, Oct. 9, 6.

## AERIAL PATTERNS OF ADULTS.

General Comment aerial behavior. Relatively little "inter-aerial" aggressiveness; Dec. 2, 172; Dec. 3, 173.

Silent Panics. Description, Oct. 11, 7; Nov. 26, 139; Nov. 27, 146; Nov. 28, 150; Dec. 2, 172; Dec. 4, 177. Low intensity, with "rattle" LCN's; Nov. 28, 150.

Erratic Flight During circular flight; Nov. 25, 124.

Circling. Absent in this species (?); Dec. 3, 173.

Rapid Flight. During circular flight; Nov. 25, 124. Associated with swoop.



modestus, INDEX, 1955.

Nov. 26, 139. After LCN and glide, Dec. 2, 170.

Pursuit Flights. Redirection, during circular flight, Nov. 25, 124.

Relatively very rare, Dec. 2, 172.

Swoop and loar. Apparently redirected "in vacuo", with "PCC", Nov. 26, 139.

Aerial LCN. General description & discussion, particularly a comparison of the two distinct morphological types; Nov. 23, 122, 125, 127; Nov. 26, 135.

Nov. 28, 150, 153; Dec. 1, 161. Relationship of "clear" LCN's to PCC(?), Nov. 28, 150, 153. General description, Nov. 25, 124; Nov. 27, 145; Dec. 1, 160;

Dec. 2, 169. Sketching aerial LCN posture, Nov. 25, 124; Nov. 26, 132. Some almost like large Larus ALC's; Nov. 26, 134. Peculiar bisyllabic LCN's,

Dec. 4, 178. Aerial LCN + glide followed by rapid turning flight, giving definite impression of high-intensity motivation, Dec. 2, 170. "Rattle" LCN's during low-intensity Silent Panic, Nov. 28, 150; during break-up of Silent Panic, Nov. 26, 139. "Rattle" LCN's by ♂ flying to visit ♀'s, Dec. 1, 161. "Rattle" LCN's before landing, Nov. 26, 135. General comment on LCN's before landing, Nov. 25, 130.

"PCC". General description; Nov. 28, 150; Dec. 1, 161. With buoyant flight, Dec. 1, 160. During accelerated flight and swoop, Nov. 26, 139; Dec. 1, 160. During low-intensity Silent Panic, Nov. 28, 150; during relaxation of Silent Panic, Nov. 27, 149.

Complete aerial L.C. performance. General description, sketch; Dec. 2, 169; Dec. 3, 173. With wing-beats, Nov. 23, 123; Nov. 26, 135, 139. With glide, Nov. 26, 138; Nov. 27, 145; Nov. 28, 152; Dec. 1, 161; Dec. 2, 166. With very steep glide, almost a swoop, Nov. 28, 155. L.C. followed by single note, reminiscent of Franklin's Gull, Dec. 5, 175. General comment, frequency, Nov. 27, 145. Glide L.C.'s given primarily by birds near me, Dec. 1, 161. The whole aerial L.C. in general appears to be a pattern only, directed toward some object or animal on the ground (?), Dec. 2, 172.

Glide. Sketch, Dec. 4, 179. Generally steeper than the glide of Franklin's Gull, Dec. 3, 173. Without L.C., during circular flight, Nov. 25, 124.

Semi-O posture. Description & sketch, Dec. 3, 175.

"Fragmented" LCN's before landing. Nov. 28, 153.



modestus. INDEX, 1955

Landing Call. Sketch of posture, Oct. 9, 6. Unababience, Nov. 25, 125.

Aerial M note. General description, Dec. 1, 159, Dec. 3, 175. General comment, Dec. 3, 173. By "isolated" flying birds, Dec. 3, 173. In association with aerial L.C., Dec. 3, 173. During upflight from predator, Nov. 25, 126. By ♂ & ♀ pair flying together, Dec. 1, 159. Before landing beside mate, Nov. 26, 136.

Circular Flights. Description, Nov. 25, 124. With LCN's, Nov. 27, 142. With LCN's, "PCC" notes, swoops & soars, Dec. 1, 140.

Alarm Call (both in air and on ground). Description, Oct. 9, 8. General comment, Nov. 27, 146. 4 syllables, Nov. 27, 140. 5 syllables, by birds on ground, Dec. 2, 166. Peculiar slow notes at beginning of silent Panic, Dec. 2, 172.

### "PURE" HOSTILITY OF ADULTS ON THE GROUND.

(Also check counts and index of pairing.)

General Comment on hostility. Relatively little hostility by birds on ground toward flying birds (?), Nov. 27, 149. Comparison of the forms of direct and redirected hostility, Dec. 2, 170, 171. Patterns before and after attacks, etc., (not included in counts), Oct. 9, 7.

Attack. Effect of differences in physical environment, Nov. 25, 127.

Unritualized pre-attack postures. Description, sketches, by both young birds and adults, Oct. 11, 9. Relative frequency of attacks without preliminary display, Dec. 1, 157.

Absence of pot. pred. reaction toward Kelp Gulls. Dec. 2, 171.

Alarm Posture. Description, Oct. 9, 8. Sketches, Oct. 11, 9; III.

U. General comment, Nov. 27, 146, Dec. 3, 174, Dec. 4, 177. The great frequency of U's, and the implications thereof, Nov. 26, 134, Nov. 28, 153. Was a short-distance pattern, Nov. 26, 131. General description, Nov. 24, 120, 127, Nov. 26, 134, Nov. 27, 148, Dec. 2, 170, Dec. 4, 178. Sketches, Nov. 26, 134, Nov. 27, 145, 147, Dec. 2, 167, 169, 170, XXI. "Egg" headset, in aggressive situations, Dec. 2, 167, during pairing, Nov. 27, 147, Dec. 4, 178. "Crested" headset, in aggressive situations,



modestus INDEX, 1955.

ons, Dec. 2, 167, 168, before copulations, Dec. 4, 178. Peculiar U, bill down and neck curved, by ♀ retreating from ♂, description & sketch, Dec. 3, 174

HF. Description, Nov. 26, 136. Obviously wasive, Oct. 11, 11. With O's & L's, Nov. 24, 119.

R. In hostile situations, with H & T, Oct. 9, 7. Zoo bird, with H or semi-H, or F or semi-F, description & sketches, Nov. 20, 109, 110. Zoo bird, with unritualized pre-attack postures, Nov. 20, 110.

"F" posture Nov. 26, 136. Pre-attack, zoo bird, Nov. 20, 110.

H. Description, zoo bird, Nov. 23, 117. Possibly hostile H & T, Nov. 5, 22. H & R, with many T's, in hostile situations, Oct. 7, 7. H & T before attack, Oct. 9, 7. H & T during escape, zoo bird, Nov. 23, 117. Sketches of H, (these are primarily based upon "sexual" H's), XXII.

Gaping General description and examples, Oct. 7, 7, Oct. 11, 9; Nov. 27, 143; Dec. 2, 167. Sketch, Oct. 7, 7.

Cpr. Apparently developing from HF, Oct. 11, 11.

T. Description of T note, Oct. 9, 7, Nov. 28, 152. Resemblance between T notes and LCN's, zoo bird, Nov. 20, 109. Examples of presumably hostile T's, Oct. 9, 6, 7, Oct. 11, 11; Nov. 5, 22. H & T before attack, Oct. 9, 7. H & T during escape, zoo bird, Nov. 23, 117.

LCN. General comment and discussion, two types of LCN, Dec. 2, 171. General description, Oct. 9, 7, 8, Nov. 24, 119, Nov. 26, 131, Nov. 27, 144; Dec. 1, 161. Apparent lack of orientation of both LCN and L.C., Nov. 26, 132. Sketches of usual LCN postures, Oct. 9, 7, 8. LCN from a "relaxed" posture, zoo bird, Nov. 20, 109. LCN from U's, sketch & description, Nov. 27, 142. LCN in a sort of "gape" posture (?), sketch, Oct. 9, 7. LCN from semi-diagonal posture, with "egg" head-up, Dec. 1, 161. LCN from diagonal posture, sketch, Nov. 24, 119. LCN from a semi-M posture, Nov. 27, 143. Adult notes possibly like those of young birds, Oct. 9, 7. LCN's before L.C.'s, Nov. 25, 123; Nov. 27, 141. Toward pat. preds., Nov. 27, 149. As a long-distance pattern, Nov. 26, 131. As a general or sexual "frustration" pattern(?);



modestus. INDEX, 1955.

Nov. 26, 131; Nov. 27, 142; Nov. 28, 151; Dec. 1, 161. Possible use of LCN's in "advertising"; Nov. 26, 132; Nov. 27, 144, 148; Nov. 28, 151. Orientation of partners calling to one another, Nov. 28, 155. Effectiveness of partners calling to one another, Dec. 2, 167.

Complete L.C. performance on the ground. General description, Nov. 24, 119, 129; Zoo bird, Nov. 20, 109; Nov. 23, 117. General comparative comments, Nov. 24, 119, 120. General comment, causal differences between O and L, Nov. 25, 130. Peculiar L.C. performance, with almost F, description & sketch, Nov. 25, 128, 129. L.C. followed by LCN (?), Nov. 25, 129. L.C. with a preliminary "rising" phase, once with preliminary LCN, Nov. 27, 141. L.C. as a possible general or sexual "frustration" pattern, Dec. 1, 161. Much commoner during M.C.'s than during low-intensity disputes, Nov. 25, 128. Orientation of L.C.'s during pairing, Nov. 25, 128.

The L.C. call itself. Description, Nov. 24, 119; Nov. 25, 126; Dec. 1, 156; Zoo bird, Nov. 23, 117. Rattle a persistently juvenile character (?), Nov. 24, 120. Similarity between L note and M notes, Nov. 25, 128.

O posture. Description, Oct. 11, 9, 10, 11; Nov. 24, 118, 119; Nov. 27, 148; Dec. 1, 161; Zoo bird, Nov. 23, 117. Sketches, Oct. 11, 9, 10; Dec. 1, 161; II, XXIII; Zoo bird, Nov. 23, 117; Nov. 24, 118. O with "egg" headset, Dec. 1, 161. Silent O's, Zoo bird; with bill movements, Nov. 20, 109; with gape, Nov. 23, 117. "Backward O's due to relatively strong escape drive (?), Nov. 25, 121.

L posture. Description, Oct. 11, 10; Nov. 25, 123; Zoo bird, Nov. 23, 117. Sketches, Oct. 11, 10; Nov. 24, 119; Nov. 25, 123; II; Zoo bird, Nov. 23, 117. L with "egg" headset, Dec. 1, 162. L with LCN's, Nov. 25, 123.

T. General description, Nov. 24, 120; Nov. 25, 129; Nov. 26, 138; Zoo bird, Nov. 20, 109; Nov. 23, 117.

Ground "PCC" Like that of Franklin's Gull, description & discussion, Dec. 4, 179.



modestus.

INDEX, 1955.

- M. Description, call & postures, Nov. 24, 120, Nov. 25, 127, 128, Nov. 26, 132, Nov. 27, 141, 147, Dec. 2, 147. Sketches, Nov. 24, 120, Nov. 27, 141, 147, ~~XXII~~. M and L postures essentially identical, Nov. 25, 126. Similarity between M notes and second part of L.C., Nov. 25, 128. M notes from "curved V" posture, sketch & description, Nov. 26, 133. M with head-turning & PAG, Nov. 25, 123. M + ch in alternation, Nov. 25, 126. Relationship between M & govt, Nov. 25, 126. M during agg. rushes, Nov. 25, 127. General comment on aggressiveness in M, Nov. 26, 134. Morphological differences between the more and the less aggressive forms of M, Nov. 27, 147. Frequency & value of M in "sexual" situations, Nov. 25, 122. General comment on the function & value of "hump" in posture, Dec. 4, 147.
- ch. Description, Nov. 25, 125, Nov. 27, 148, Nov. 28, 151, Dec. 1, 157, 158. Sketches, Nov. 25, 125, Nov. 27, 148, Dec. 1, 157. M + ch in alternation, Nov. 25, 126. Circumstances, Nov. 25, 125, 126. ch. during cop, by ♂, Nov. 27, 148.

## PAIRING AND SEXUAL PATTERNS OF ADULTS

(also chick counts)

### General Comments on pairing

General comments on possible types of pair-formation "advertising", Nov. 26, 138. "Advertising" ICN's, Nov. 26, 132, Nov. 27, 144, 148, Nov. 28, 151. ♂ flying to visit and "invite" neighbor, Nov. 27, 144. ♂ behaving like B.h.g. ♂'s, invitations to flying birds, circular flights, redirected aggressiveness, etc., then changing to go visiting neighbors on foot, Nov. 27, 142. Difference between "right" and "wrong" responses to invitation visits, Dec. 2, 148. General comment on tendency of mated birds to make "overtures" to "strangers" when their own mates are absent, Dec. 4, 146. The usually restrained response of mated and/or uninterested birds to invitation visits by strangers, Nov. 28, 153.

General comment on "early" pairing patterns (part of which



*modestus.* INDEX, 1955.

is based on the behavior of birds which had already formed their very first pair-bonds). Analysis of the whole she-bang, V complex, M complex and LCN-O complex, Dec. 1, 162, No 3. L.C. elements presumably higher intensity than the V and M elements, and also relatively more hostile than many V and M complexes, Nov. 28, 153. Minor comments, and descriptions of illustrative examples of mutual displays involving i.c. elements as well as V and M complexes; Nov. 25, 121, 125, Nov. 26, 133, 138, Nov. 27, 142, 146, Nov. 28, 149, 151. Minor comments and descriptions of illustrative examples of mutual displays involving only V and M complexes; Nov. 25, 124, 125, 126, Nov. 27, 144. General comment on the resemblances between the non-aerial pairing behavior of this species and the corresponding behavior of the Laughing Gull described by H. & W., Dec. 1, 163. Note on the fluidity and variability of pairing behavior in this species [LCN's, O's and M's apparently produced by "frustrated" sex drive; Nov. 26, 138, Nov. 27, 142]

General comment on my counts, Nov. 28, 150, 153; Dec. 4, 174

General comment on M.C.'s, Nov. 27, 143; Dec. 2, 167

Relatively few attacks by ♂'s on ♀'s, Nov. 26, 132. General escape tendency of ♀'s during early pairing

Relatively great frequency of redirected aggressiveness, vented on neighbors, during pairing and "sexual" behavior; it makes up a surprisingly high percentage of the total aggressiveness in the group as a whole; Dec. 2, 170. Apparent absence of hostility provoked by neighbors or intruders and redirected upon mate, Dec. 2, 170.

Possible cases of pair-formation, Oct. 9, 7; Oct. 11, 10, 11; Nov. 27, 142, 143, 148, 149; Nov. 28, 149, 151, 154; Dec. 1, 161; Dec. 2, 168.

Most interesting cases of mutual pairing behavior, (some of this far from "early"); Nov. 25, 121, 124, 125; Nov. 26, 138; Nov. 27, 142, 143, 144; Nov. 28, 154; Dec. 1, 161, 162; Dec. 2, 168; Dec. 3, 174; Dec. 4, 177.

Unmated ♀'s apparently making invitation visits to mated ♂'s, Nov. 27, 147; Nov. 28, 155; Dec. 4, 178. Mated ♂ apparently making an invitation visit to a single ♂, Dec. 1, 156. Mated ♀'s apparently making invit.



*modestus*

INDEX, 1955

ation visits to mated ♂'s, Nov. 27, 148, Nov. 28, 151. Semi-mated bird "playing the field", Dec. 1, 162. Nice case of ♂ displaying with 2 ♀'s, ♀ displaying with 2 ♂'s, Nov. 27, 148. Example of mobile pairing like that of the Little Gull, Dec. 1, 162. Redirected aggressiveness by ♂'s, during early - moderately late pairing, Nov. 26, 133; Nov. 27, 142; Nov. 28, 150. Redirected aggressiveness by ♀'s, during early - moderately late pairing, Nov. 28, 150.

U. See pre-cop references.

HF. As part of "cautious" V complex, with SS, by visiting ♀'s, Nov. 28, 155. With V, T, & SS, by reluctant ♀'s before cop, Dec. 1, 158.

SS. General comments, Nov. 25, 127. Illustrative cases, Nov. 27, 142, 143; Nov. 28, 151, 155. By reluctant ♀'s, with V's, T's, & HF's, before cop, Dec. 1, 158. By ♀'s during cop, Nov. 28, 152.

Counting bell toward partner. Description, Nov. 26, 132; Nov. 27, 146.

Gasts. During invitations, Nov. 27, 142. During M.C.'s, Nov. 25, 121, 125. Relationship to M, Nov. 25, 126.

Pr. during M.C.'s. Apparently not ritualized, description, Nov. 25, 121, 126. General comment, Nov. 25, 126; Nov. 28, 154.

Circular flights. Description, Nov. 25, 124.

H. Pre-cop H posture, sketch & description, Dec. 1, 159. Other sketches, XXII.

T. Descriptions, (many with sketches), Nov. 24, 118; Nov. 25, 122, 128, 129; Nov. 26, 132, 137; Nov. 27, 147; Dec. 1, 156, 158; Dec. 3, 175. T from M, description & sketches, Nov. 28, 152. T with SS, Nov. 25, 122. General discussion of occurrence of T during early pairing, Nov. 27, 148, 149.

M. Comment, frequency & use in pairing & several circumstances, Nov. 25, 122. As usual way of approaching partner, Nov. 25, 125, 126; Nov. 26, 135, 138; Nov. 28, 154. As means of calling partner, Nov. 26, 135; Nov. 28, 155. As part of recognize complex, Nov. 25, 128. During redirected hostility, Nov. 27, 149. Members of pair running along together in M, Nov. 27, 140. ♂ running through group, in M, pausing to give "invitation" displays to several ♀'s, good examples, Nov. 28, 151. M notes by bird



*modestus.*

## INDEX, 1955.

frustrated in mounting attempts, description & sketches, Dec. 1, 158, 159. M during copulation, by ♂, Nov. 27, 146, 148, Dec. 1, 158.

General note on the motivation of M call in "sexual" situations, Dec. 2, 168. M posture essentially identical with L posture. Description & sketch of T from M, much like F, Nov. 28, 152.

♀ FB, ♂ regurge, and feeding of the ♀ by the ♂. Description, Nov. 25, 128, Dec. 2, 168. PAG as intention movement of regurge, Nov. 28, 152.

♀ regurge (?) sketches & descriptions, Nov. 23, 122, Nov. 26, 133, Dec. 1, 158.

Pre-Cop behavior Description, Nov. 25, 121, 122, 123, Nov. 26, 134, 135, 137, Dec. 1, 158, Dec. 2, 168, Dec. 3, 175, Dec. 4, 178.

general comment, Nov. 26, 137, Nov. 27, 147, Nov. 28, 152, Dec. 1, 158, Dec. 4, 176. U's, with some T's, many HF's and SS's, by reluctant ♀'s, Dec. 1, 158. Redirected ♂ aggressiveness, Dec. 2, 168. Particularly interesting case, redirected aggressiveness by both birds, and a general discussion of the significance of redirection instead of mounting, Dec. 2, 169.

Copulation Description, Nov. 25, 122, 125, 126, Nov. 26, 131, 132, 136.

Triple copulation, Dec. 4, 178. ♀ trying to mount ♂, Dec. 1, 159. FB by ♀ persisting during the cop (?), Nov. 28, 150. ♀ standing in U+SS during cop, Nov. 28, 152. Both birds giving LCN's after ♂ has mounted, Dec. 4, 176. ♂ pecking ♀ during cop, Nov. 26, 136. Copulation call only given during the most hostile moments, Nov. 25, 125, 126, Nov. 26, 131. Cop. call with bill closed, Nov. 25, 126. ♂ giving M notes during cop, Nov. 27, 146, 148. ♂ giving Ch. notes during copulation, Nov. 27, 148. The mere act of mounting as a "consummatory act", Dec. 4, 177.

Rape Pomble case, Nov. 27, 147.



Physical Description of the Birds. Feb. 16, 281, 282; Feb. 17, 284.

General Comment. Feb. 13, 276; Feb. 15, 279; Feb. 16, 282; Feb. 17, 283.

Comments on resemblances to other species. Feb. 13, 277; Feb. 16, 280, 282; Feb. 17, 285.

General Comment on Calls. Feb. 13, 277; Feb. 15, 279.

General Comment on Hostility. Feb. 17, 285.

General Comment on Hostility between Partners. Feb. 17, 283.

Aerial Disputing & Fighting Behavior. Description, Feb. 13, 277; Feb. 15, 278; Feb. 16, 280.

Alarm Posture. Description, Feb. 16, 281. Sketches, Feb. 16, 281,

XXXI.

"Nervous" side-to-side Head-turning. Description, Feb. 13, 276.

"Nervous" Yawning. Description, Feb. 13, 276; Feb. 15, 277; Feb. 16, 282.

"Nervous" Preening. Description, Feb. 15, 277.

Postures. Sketches, Feb. 17, 284, XXXI. As possible "general frustration" reaction, Feb. 16, 282. As "nervous" reaction to pot. pred., Feb. 15, 277. As "greeting" toward mate, Feb. 15, 277; Feb. 17, 283, 284. As a possible reaction to mate in other circumstances, Feb. 16, 281, 282.

Tik Notes. Description, Feb. 13, 276; Feb. 15, 278, 279; Feb. 16, 280, 282; Feb. 17, 283. As pot. pred. reaction, Feb. 18, 284. As part of "greeting", Feb. 18, 277.

Wheet Notes. Description, Feb. 13, 276; Feb. 15, 279.

Long Caw. Description, Feb. 13, 276; Feb. 15, 277. Series of LCWN's, Feb. 13, 276.

Short Cawing. Description, Feb. 13, 277; Feb. 15, 279; Feb. 16, 281. Low intensity version, Feb. 17, 283. Sketches of accompanying posture, Feb. 16, 281, XXXI.

"Greetings" between Mates. Posts, Feb. 15, 277; Feb. 17, 283, 284. Tik or "sharp" notes, Feb. 15, 277. Invitation to sexual preening, Feb. 15, 278; Feb. 16, 280.



*alba.* INDEX, 1956.

Looking-away Movements Between partners, possibly avoidance movements, Feb. 17, 283.

Social or Mutual Preening. Description, Feb. 13, 276; Feb. 15, 278, 279, Feb. 16, 280, 282, Feb. 17, 283. With "pokes" at partner's bill, Feb. 16, 280, 281, 282. Sketches of invitation pictures, Feb. 15, 278; Feb. 16, 280, XXXI. Sketches of the actual preening itself, Feb. 15, 278; Feb. 16, 282, XXXII. General comment on relationship between social preening and individual preening, Feb. 16, 282, 283.

Muffled Note. Possible relationship to "preening" of Brown Noddy.

(See also the general comparison between Fairy Tern and Brown Noddy).

*Anous stolidus.* INDEX, 1955-56. (All descriptions refer to the Easter Island form unless otherwise noted).

GENERAL.

Physical Description of the birds. Feb. 11, 241, 242; Feb. 13, 247, 250; Feb. 14, 252; Feb. 16, 263, 264, 265; Feb. 17, 266.

General Comment. Feb. 11, 238, 242; Feb. 12, 243; Feb. 16, 260, 263; Feb. 17, 272. Little hostile parties flying from place to place on top of cliff, Feb. 11, 238. Lack of display by birds on ground toward flying birds, Feb. 12, 244; exceptions, Feb. 17, 266, 270.

General Comment on voice. Feb. 11, 241.

JUVENILE BIRDS.

U+G by Juvenile. Feb. 13, 251.

Abundance of reaction toward predatory birds, Feb. 15, 259.



Stelidus.

INDEX, 1955-56.

Juvenile Hostile Note. Feb. 12, 247; Feb. 13, 251. By downy chick, Feb. 18, 275.

General Hostile Reaction of Neighbors to Juvenile. Feb. 17, 269.

Juvenile H posture. Description & sketch, Feb. 17, 269.

FB by Juvenile. Feb. 16, 262, 263, 264.

### AERIAL PATTERNS OF ADULTS.

Silent Panics. Panic flight, Feb. 15, 259.

Circling. Description, Feb. 11, 241.

Aerial fighting. Description, Feb. 12, 244; Feb. 13, 248.

Permit Flights. Little ritualized, with SCW, Feb. 11, 240; Feb. 12, 243. With both SCW and LCWN's, Feb. 17, 272. Like beginning of High Flight, Feb. 11, 242.

Swoop & Lunge toward Potential Predators. Description, Feb. 11, 240, 241.

Landing Technique. Peculiar quivering wing-beats, Feb. 16, 264.

Aerial O Posture. Sketch, Feb. 17, 271.

Aerial "st." Posture. Description & sketch, Feb. 17, 272.

Simple LCWN in flight. Description, Feb. 11, 240.

Simple SCW in flight. Description, Feb. 11, 240; Feb. 13, 251.

Butterfly Flight. By itself, Feb. 15, 1956. As part of the High Flight complex, Feb. 15, 253, 254.

High Flight. Description, Feb. 12, 245, 246; Feb. 15, 253, 254, 255, 256, 258; Feb. 16, 260, 262; Feb. 17, 269. Three birds involved, Feb. 16, 262. Sketch rising flight postures, Feb. 15, 256. Sketch aerial O, Feb. 15, 253. Sketch descending glide posture, Feb. 15, 253. General summary, Feb. 15, 254, 255. Comparison with Stelidus High Flights, Feb. 15, 255. Possible causes, Feb. 15, 254, 256.

Circular Flights. Description, Feb. 12, 245; Feb. 16, 264; Feb. 17, 272. By possibly innately birds, obviously very aggressive, Feb. 17, 270. During mutual displays between mates, Feb. 17, 272.

"Jk" Attack Call. Description, Feb. 11, 241.



PATTERNS OF ADULTS ON THE GROUND. (+).

Apparent Absence of Alarm Call. Feb. 13, 250.

Alarm Posture, (or Aux. V. apart from Nodding) Description; Feb. 11, 238, Feb. 16, 265, sketches; Feb. 16, 265, ~~XXIX~~.

Acts when "nervous". Feb. 11, 238.

Side-to-Side Head-Turning when "nervous". Toward pot, preds., Feb. 11, 238. During intra-specific encounters, Feb. 15, 257.

Yawns when "nervous". Feb. 13, 249, 252.

"Nervous" Preening. Toward pot, preds., Feb. 11, 238. During mutual displaying between mates, Feb. 17, 266, 267.

Oct. 27, 21 (Galapagos).

Long Caws. Description; Feb. 11, 238, 239, 240, Feb. 12, 243, Feb. 15, 258, 259, Feb. 16, 263, 264, Feb. 17, 270. "Attack version"; Feb. 11, 240, Feb. 14, 252. Riving movements with LCWN's a form of Nodding?; Feb. 15, 258, 259. Semi-V posture between LCWN's, Feb. 11, 239. LCWN's transitional to Rattle, Feb. 11, 242. Resemblance to LCN's of gulls, Feb. 11, 240.

Circumstances. As SCW declines; Feb. 11, 240, Feb. 12, 243, 244, Feb. 13, 248. During boundary disputes, Feb. 12, 243, Feb. 13, 248. As landing call, Feb. 12, 243. As attack call toward pot, preds.; Feb. 11, 240, Feb. 14, 252. With Nodding, Feb. 15, 258. During Butterfly Flights, Feb. 15, 253, 255, 256, 258. During circular flights, Feb. 17, 272.

General discussion of motivation. Feb. 11, 240, 241.

Short Cawing. Description; Feb. 11, 238, 240, Feb. 12, 244, Feb. 13, 251, Feb. 15, 258, Feb. 16, 262, 263, 264, Feb. 17, 268, 269, 270, 271, 272, Feb. 18, 273. Possibly peculiar "attack version", description & discussion, Feb. 15, 258. Resemblance to the yelp and dit patterns of other laeids, Feb. 11, 240.

Circumstances. Before attack on ground, Feb. 11, 240, Feb. 14, 253. During boundary disputes, Feb. 12, 243, Feb. 13,



*Stolidus.*

## INDEX, 1955-56.

248. With Nodding, Feb. 13, 250. During aenal fighting, Feb. 15, 258. As pre-flight pattern, Feb. 18, 273. By pursuer during pursuit flights, Feb. 11, 240. During rising High Flights, Feb. 15, 253, 254, 255, 256, 258. Before circular flights, Feb. 12, 245; Feb. 16, 264; Feb. 17, 272; Feb. 18, 273. During circular flights, Feb. 17, 272.

General discussion of the differences in motivation between LCW and SCW, Feb. 11, 240. SCW as a "high intensity rhythm" call?, Feb. 14, 253. SCW as a possible "sexual frustration" pattern, Feb. 17, 271.

Rattle. Description, Feb. 11, 241; Feb. 14, 252; Feb. 17, 271; Feb. 18, 274.

Semi-V Posture accompanying some LCWN's. Galapagos, sketch, Oct. 27, 21.

O Posture. Description, Feb. 11, 239; Feb. 13, 251; Feb. 15, 256.

Sketch, Feb. 13, 251, ~~XXIX~~. Sketch, tongue visible, Feb. 16, 263.

O-L Intermediates. Description, Feb. 11, 239.

L Posture. Description, Feb. 11, 239. L+G, Feb. 16, 265. Sketch of L+G, Feb. 16, 265. Lack of L on ledge of cliffs, Feb. 12, 245.

Nodding. Description, Feb. 11, 241; Feb. 12, 243, 244, 245, 246; Feb. 13, 247, 248, 249, 250; Feb. 14, 252; Feb. 15, 258; Feb. 16, 259, 260, 261, 264, 265; Feb. 17, 266, 267, 268, 269, 270, 271, 272; Feb. 18, 273, 274. General descriptive comments, Feb. 13, 248, 250; Feb. 15, 256; Feb. 17, 267.

Circumstances. Disputes between neighbors, Feb. 12, 244; Feb. 13, 248. In little hostile parties, Feb. 11, 241 after pursuit flight, Feb. 12, 243. Associated with mutual preening, Feb. 16, 262. By adult to its own young, Feb. 17, 271.

General Comment on Motivation, Feb. 12, 243; Feb. 18, 277.

Sign stimuli Revealed, discussion, Feb. 15, 259.



stolidus. INDEX, 1955-56

Sketches of V, Feb. 12, 246; Feb. 13, 247, 248; Feb. 16, 265, Feb. 17, 269; Feb. 18, 274, ~~XXX~~. Sketches of V+G, Feb. 12, 245; Feb. 13, 249; Feb. 14, 252; Feb. 15, 258, 259; Feb. 16, 264; Feb. 17, 266, 268; ~~XXX~~. Agg. V+G before attack, Feb. 11, 242.

Gaits without any other nodding elements, description & comment, Feb. 12, 244; Feb. 15, 256; Feb. 16, 261. Gaits as appearance?, Feb. 13, 250. Sketches of Gaits, Feb. 12, 244; Feb. 13, 247, 248; with tail above wings, Feb. 16, 261. Sketches of Gaits + G, Feb. 13, 248; Feb. 14, 253; Feb. 16, 261, ~~XXX~~.

G as low intensity pattern?, Feb. 12, 244. G as relatively aggressive or high intensity, Feb. 13, 247. Sketches of G, Feb. 11, 242; Feb. 12, 244.

Sketches of L+G, Feb. 16, 265; Feb. 18, 275, ~~XXX~~.

Sketch of uni-St, Feb. 12, 246; Feb. 13, 249.

LCW in association with nodding, Feb. 15, 258; Feb. 17, 267, 270, 272. SCW in association with nodding, Feb. 13, 250; Feb. 17, 272. Sketch LCWN posture, Feb. 15, 258. Sketch of St. or SCW posture, Feb. 13, 251.

Sketch of HFK, Feb. 13, 249. HFK with lateral head-shakes, Feb. 18, 275. HFK not an "integral" part of nodding?, Feb. 13, 250. HFK derived from comfort movement, Feb. 13, 247.

Choking Description, Feb. 12, 246; Feb. 13, 249, 250, 252; Feb. 15, 256, 257; Feb. 16, 259, 260, 261, 262, 263, 265; Feb. 17, 266, 267, 268, 269, 270, 271, 272; Feb. 18, 273, 275. Sketches of Choking postures, Feb. 12, 245; Feb. 15, 257; Feb. 16, 265; Feb. 17, 266, 267, ~~XXXIII~~. Sketches mutual Ch, Feb. 16, 263, ~~XXXIII~~, accompanied by call, Feb. 15, 257.

Circumstances. Purely hostile Ch. by solitary bird, Feb. 16, 263. During boundary disputes, Feb. 15, 257. Associated with nodding, Feb. 13, 249, 250, 252; Feb. 15, 257; Feb. 16, 259, 260, 261, 265; Feb. 17, 267, 269, 271, 272. Associated with both.



*stolidus.*

## INDEX, 1955-56.

Nodding and FB, Feb. 16, 259, 260, 261. As a response to FB or associated with FB, Feb. 12, 246, Feb. 13, 250, Feb. 16, 259, 260, 261, 262, Feb. 17, 268, 272, Feb. 18, 273. Associated with mutual preening, (+ LCWN's, SCW, & nodding), Feb. 17, 267. Associated with nest-building, Feb. 16, 261, Feb. 17, 267, 268, 271. General comment, Ch. as mutually redirected pattern between mates, provoked by hostility toward neighbors, Feb. 17, 268.

Discussion of motivation, Feb. 16, 260, 265.

Derivation, from nest-building, Feb. 17, 268, 269, Feb. 18, 274.

Possible Pair-formation Behavior. Description + discussion, Feb. 17, 270, Feb. 18, 274.

Greetings between Mates. Greet alone, Feb. 13, 249. Ch. - LCWN's - Nodding - Ch - Gests, Feb. 17, 269. Nodding, examples, Feb. 12, 245, Feb. 13, 249, Feb. 17, 266, 267. Nodding, + actual attack by one bird on the other, Feb. 17, 267. Ch., example, Feb. 17, 268. For mutual displays between mates in general see Nodding + Choking above.

Hostility provoked by mate redirected on neighbors. Feb. 17, 272.

Mutual Preening. Description, Feb. 13, 251, Feb. 16, 261, 262, Feb. 17, 267, 268. Sketch, Feb. 16, 262.

♀ FB. Description, Feb. 12, 246, Feb. 13, 250, Feb. 15, 257, Feb. 16, 259, 260, 261, Feb. 17, 272, Feb. 18, 273. Best incident, Feb. 18, 273. Sketches, Feb. 16, 262, Feb. 17, 272, XXXIV. Sketches, tail above wings, Feb. 16, 261, XXXIV.

♂ Regurge for ♀. See ♀ FB. Best incident, Feb. 18, 273.

Copulation. Description, Feb. 16, 259, 260. General comment on rarity, Feb. 17, 267, Feb. 18, 274. Hostile response (LCWN's & SCW) of neighbors to copulation, Feb. 16, 260.

Post-Cop. Display. Choking, Feb. 16, 260.



*Stolidus.*

INDEX, 1955-56.

Beginning of "real" Nest-building & Incubation Phase Feb. 16, 261; Feb. 17, 268; Feb. 18, 274.

Nest-building as a result of thwarted Incubation Drive Feb. 12, 246.

Adult Regurge for Young. Quite "painful", description & sketch, Feb. 13, 252.

(See also the general comparison between the Brown Noddy and the Inca Tern).

*Rhynchops nigra.*INDEX, 1956. (Probably the subspecies *intercedens*.)

Physical Description of the Birds. Mar. 16, 308; Mar. 17, 314; Mar. 19, 316, 317, 318, 319.

General Comment. Mar. 16, 307, 308; Mar. 17, 313, 314, 315.

General Comment on voice. Mar. 16, 308.

Silent Panics. Description & discussion; Mar. 16, 307; Mar. 17, 314, 315; Mar. 19, 316. "Intention movements" of Silent Panics, Mar. 17, 314. Skimming during panics, Mar. 17, 317.

Unritualized Attack Postures. Like F, description & sketch, Mar. 19, 318. Like O or V, description, Mar. 19, 318.

Absence of Distinct Alarm Call. Mar. 19, 318.

Yawns when "nervous" Mar. 19, 316.

Hostile Bill-dipping. When "nervous" about pet. peds., Mar. 19, 317. During intra-specific disputes, Mar. 19, 317.

Alarm Posture. Description, Mar. 19, 315.

General Discussion of "V", "O-V" & LCN Postures. Mar. 19, 318.

Simple Semi-O-semi-V Posture. Description; Mar. 17, 314, 315; Mar. 19, 316, 318. With LCN?, Mar. 19, 317. With op-



*Rhynchops nigra.*

INDEX, 1956

ening & closing of bill, but no sound, Mar. 19, 318. By re-treating birds, Mar. 17, 314. Without retreat, Mar. 17, 315.

General discussion, Mar. 19, 316.

Semi-U-semi-O Posture plus G. Description, Mar. 16, 307, Mar. 17, 314, Mar. 19, 318. Sketch, Mar. 16, 307. With fencing, Mar. 17, 313. With slow opening & closing of bill during fencing, Mar. 19, 315. With "Klappering", Mar. 16, 307. Circumstances. By attacking birds, Mar. 17, 314. By retreating birds, Mar. 17, 314. After games, Mar. 17, 314.

Gaping itself. With tongue raised during semi-O-semi-U, Mar. 19, 316, 318. Very aggressive, Mar. 17, 314, 315.

G's with Virtualized Pre-attack Postures. Description, Mar. 17, 314.

LCN's. General description sound, Mar. 16, 307, Mar. 17, 313, 315, Mar. 19, 316, 317, 318. "Sharp" LCN's by flying birds; Mar. 16, 307, Mar. 19, 316. "Sharp" LCN's by birds on ground, Mar. 17, 315.

From semi-O-semi-U posture, Mar. 16, 307. From extreme semi-O-semi-U posture, with slight opening and closing of bill, Mar. 19, 317. From slight U, with slight opening and closing of bill, Mar. 19, 317. From "relaxed" posture, with slight "throw-backs", Mar. 19, 315, 317, 319, sketch, Mar. 19, 319. With bill closed?, Mar. 19, 317.

Circumstances. Flying up in panic, Mar. 16, 307, Mar. 17, 314. Landing after panic, Mar. 16, 307, Mar. 17, 314, Mar. 19, 317. General contagiousness of LCN's, Mar. 17, 314.

General discussion of motivation, Mar. 19, 316, 318.



*Larus furcatus.*

INDEX, 1955-56

Physical Description of the Birds. Mar. 16, 303, 304, 305, 306, March 17, 310. Sketch winter plumage, Mar. 16, 305.

General Comment Oct. 24, 12; Mar. 16, 303, 304, 305, 307, Mar. 17, 309, 310, 311, Mar. 20, 319, 321.

Aerial O Posture. Description, with Ratchet, Mar. 16, 306. With both Ratchet & Whistle, Mar. 17, 310; Mar. 20, 319. Sketches, Oct. 24, 14; Mar. 16, 306; Mar. 17, 313.

Swoop & Soar. Toward us, movements apparently unmutualized, Whistles during swoops, Oct. 24, 15.

Clam Posture. Description, Oct. 24, 12; Mar. 17, 313.

Gaping. Description, toward pot. preds., Oct. 24, 12; after last display during intra-specific dispute, Mar. 20, 321.

OCB. When alarmed, Oct. 24, 14.

Slow side-to-side Head-turning. When alarmed by pot. preds., Oct. 24, 14; Mar. 20, 320.

Lateral Head-shakes. When alarmed by pot. preds., Oct. 24, 14.

Possible "Nervous" Preening by Flying Birds. Description, Mar. 16, 304; Mar. 17, 310; Mar. 20, 319. Comment, Mar. 20, 319.

Possible Hostile Comfort Movements on Water. During intra-specific disputes, Mar. 20, 320, 321.

Possible Hostile "Pointing Bill Upward". Description, Mar. 17, 309, 310. Sketch, Mar. 17, 309. With lateral head-shakes, Mar. 17, 310. Toward flying bird, Mar. 17, 310.

Buzz Notes. Description, Mar. 16, 303, 304, 305, 306; Mar. 17, 310, 311, 312; Mar. 20, 319, 320. With bill-rattling and yawn, Mar. 17, 311. Followed by lateral head-shakes, Mar. 20, 319. Circumstances. Birds taking flight, example, (actually I heard many more cases), Mar. 20, 319. Flying away from boat, Mar. 16, 303, 304. As reaction to Jaeger, Mar. 16, 306. Comment on motivation, Mar. 17, 313.

Notes intermediate between Buzz & Peep. Mar. 20, 320.



*furcatus.*

INDEX, 1955-56

Notes intermediate between Buzz and Ratchet. Mar. 16, 305, 306; Mar. 17, 310.

Relationship between Buzz and Ratchet Mar. 16, 305; Mar. 17, 311. Buzz lower intensity than Ratchet; Mar. 17, 310.

Ratchet - Whistle Posture Description; Mar. 16, 303; Mar. 17, 313. Sketches; Mar. 16, 303; V.

Ratchet (or Ticking). Description; Oct. 24, 12, 13; Mar. 16, 303, 304, 306; Mar. 17, 310, 313; Mar. 20, 321. Diagrams; Oct. 24, 12. From very diagonal O posture, on water; Mar. 20, 321. In breast-closed posture, description & sketch; Oct. 24, 13. In usual semi-O posture; Oct. 24, 12; Mar. 16, 303; Mar. 17, 313; sketches; Mar. 16, 303; V. Circumstances. Intra-specific threat; Mar. 16, 303. Mar. 20, 321. Directed toward pet. peds; Oct. 24, 13. Birds taking flight from boat; Mar. 16, 306. Birds simply flying up; Mar. 17, 310. By flying birds; Oct. 24, 14; Mar. 16, 306; Mar. 17, 310; Mar. 20, 319. Contagious; Mar. 20, 320. General discussion; Oct. 24, 12, 13. Related to A.C. or (more probably) L.C. of other species; Oct. 24, 12.

Notes intermediate between Ratchet and Whistle. Mar. 16, 306.

Relationship between Ratchet and Whistle. Oct. 24, 12, 13; Mar. 16, 304.

Whistle Description; Oct. 24, 13, 14, 15; Mar. 16, 303, 304, 306; Mar. 17, 311, 313; Mar. 20, 319, 320. Diagram; Oct. 24, 13. Double Note?; Mar. 16, 304. In usual semi-O posture; Oct. 24, 12; Mar. 16, 303; Mar. 17, 313; sketches; Mar. 16, 303; V. In extremely low diagonal O, description & sketch; Oct. 24, 14. Circumstances. Intra-specific threat; Mar. 16, 303; Mar. 20, 321. Toward pet. peds; Oct. 24, 13. Toward mate; Oct. 24, 13. Left Whistle by bird on ground toward flying bird; Oct. 24, 13. As reaction to Jaeger; Mar. 16, 306. Bird taking flight from boat; Mar. 16, 306. After Ratchet, many cases, example; Mar. 16, 306. By flying birds; Oct. 24, 14, 15; Mar. 17, 310; Mar. 20, 319.



*furcatus*

INDEX, 1955-56

During swoops, Oct. 24, 15. Birds simply flying up, Mar. 16, 303; Mar. 17, 310; Mar. 20, 319. Contagious, Mar. 20, 320. Whistles higher intensity, on the average, than Buzz-Ratchets, Mar. 17, 311.

Peep. Description, Mar. 16, 304, 306; Mar. 17, 311, 312, 313; Mar. 20, 319, 321. Sketches, Mar. 17, 312. With head & bill pointing downward, with and without lateral head-shaking and tongue-raising, Mar. 17, 312. Preceded by lateral head-shaking, Mar. 20, 320. From perfectly "relaxed" posture, Mar. 20, 319, 320. Double note?, Mar. 16, 304. Circumstances. Flying up from boat, Mar. 16, 305. As reaction to Jaeger, Mar. 16, 306. As aerial pattern, Mar. 16, 306. Contagious, Mar. 20, 321.

Comments on motivation, Mar. 17, 313; Mar. 20, 320, 321.

Correlation between Ratchet-Whistles and Peeps. Mar. 20, 321.

Choking? Description, Oct. 24, 14.

*Larus cirrhocephalus*

INDEX, 1955-56

Physical Description of the Birds. Sep. 28, 2, 3; Oct. 4, 5; Nov. 18, 105R; Mar. 28, 323; April 2, 326. Sketch, I.

General Comment. Sep. 28, 2; Oct. 4, 5; Nov. 18, 105R; Mar. 15, 302; Mar. 16, 308; Mar. 28, 323; April 2, 323, 325.

General Comment on Voice. LCN's & L.C. Sep. 28, 2.

Juvenile LCN. Description, Nov. 18, 105R.

Aerial Fighting. Simple, Oct. 3, 3.

Aerial Chasing. Simple, Oct. 3, 3. With buoyant flight and "PCC"

Swoop and Soar. Description, April 2, 325.

Absence of Landing Call? Oct. 3, 3.

Alarm Posture. Nov. 18, 105R.

Mutualized Ambivalent Hostile Postures. Description; Sep. 28, 2; Oct. 4, 4; April 3, 327. Sketches, Oct. 4, 4, IV.

Circling Mar. 28, 323.



*Leucorhynchus*. INDEX, 1955-56

- U+HF Description, April 2, 326.
- Al. C. By flying birds, description, Mar. 28, 323, April 2, 323.  
Discussion of motivation, April 2, 324.
- "Staccato" LCN's Description, Oct. 4, 5, April 3, 327. Discussion of motivation, April 3, 327.
- LCN. Description, Sep. 28, 2, Mar. 28, 323, April 2, 324. Long LCN or PCC during dispute on ground, Nov. 18, 105R. General discussion, April 2, 324.
- "PCC" Aerial, description, Oct. 3, 3, April 2, 324, diagrams, Oct. 3, 3, April 2, 324. Possible call on ground, Nov. 18, 105R.
- "PCC" and Long LCN Aerial Postures Description, April 2, 324. Sketches, Oct. 3, 3.
- L. C. Description, Sep. 28, 2.
- O Posture Description, Oct. 4, 5, Nov. 18, 105R, Mar. 18, 302, April 2, 325, 326. Sketches, Oct. 4, 5, Nov. 18, 105R, IV. Clucking call, Nov. 18, 105R, April 2, 326.
- F Posture Description, Oct. 13, 5, April 2, 326. Sketches, IV. Probably silent F+R, description, Nov. 18, 105R; sketches, IV.
- H+R. With LCN's. Description, Mar. 16, 308, April 2, 326.
- M.C. O-F-U+HF, April 2, 325, April 3, 326.

*Larus belcheri*. INDEX, 1955-56

## JUVENILE BIRDS. (all captive)

- General Comment Nov. 20, 107R, 108, Nov. 21, 113.
- General Comment on Hostility Nov. 21, 113.
- Alarm Posture - Aur. V Description, Nov. 20, 107R. Plus HF, after being attacked, Nov. 22, 116.
- HF. Plus Aur. V., after being attacked, Nov. 22, 116.



belcheri.

INDEX, 1955-56

Gaits Rare, Nov. 20, 108PAG After L.C. performance (HD-0), Nov. 20, 115.Gaping Apparently as threat, without attack, Nov. 20, 107R.

Before HD-0, Nov. 21, 113. During attack, Nov. 20, 107R.

LCN's Like Juvenile LCN's of other Landis. Description, Nov. 20, 107R, Nov. 22, 115"Fragmented" LCN's. Description, Nov. 20, 107R. Before attack, Nov. 20, 107R, Nov. 22, 115. Apparently higher intensity and/or more aggressive than "typical" Juv LCN's, Nov. 22, 115. General comment on the implications of the existence of this "fragmented" pattern, Nov. 20, 107R.LCN Postures Description, sketches, Nov. 20, 107R.L.C. HD-0, the whole performance generally like that of adults, but voice slightly hoarser, Nov. 20, 108. Diagram, Nov. 22, 115.

Sketch HD, XVII. In LCN Posture, Nov. 22, 115.

Ch. Rare. Description, Nov. 20, 108, Nov. 21, 113. Sketch, XVI.H & Begging Description, Nov. 20, 108, Nov. 22, 115.

## ADULT BIRDS. (all wild)

Physical Description of the Birds Nov. 7, 22, 24, Nov. 14, 103, 104, Nov. 17, 104R.General Comment Nov. 14, 102, Nov. 16, 107, Mar. 15, 302.General Comment on Relationship. Nov. 7, 23.General Comment on Voice Comparative position, Nov. 7, 23, Nov. 24, 102. Weakness, Nov. 19, 106R.General Comment on Hostility. Nov. 17, 102R, 103R.Territorialism. Nov. 14, 102, Nov. 17, 104R, 105R.Counts Communal Area Hostile Display Nov. 7, 23.Adult LCN's Description, Nov. 7, 23. Relatively great frequency, Nov. 16, 107. Long LCN's with swoop, Nov. 7, 23.



Lulcheri.

INDEX, 1955-56

Apparent Absence of Aerial L.C. Comment, Nov. 14, 107, Mar. 15, 302Landing Call Generally rare? Description & diagram, Mar. 15, 302Swoop & Fear Description, Nov. 7, 23Al C. In air, description, Nov. 7, 24, Nov. 14, 103Gaping During attack, Nov. 17, 105RPost. Description, Nov. 14, 102 sketches, Nov. 14, 102, XVIII. Almost identical with Ch. postures, Nov. 17, 106R. With bill open, Nov. 14, 104. Leading to HD, Nov. 17, 102R. Leading to PAG, Nov. 14, 104. Leading to "grass-pulling", Nov. 17, 102R. Leading to "feeding", Nov. 14, 104. Leading to "drinking", Nov. 14, 104. Leading to Ch, Nov. 17, 102R. Leading to comfort movements, Nov. 17, 102R. During prolonged dispute, Nov. 17, 102R. During M.C., and between mates in general: see M.C. Pre-cop., Nov. 16, 106V. Agg. V. description, Nov. 7, 22, Nov. 17, 103R, sketches, Nov. 17, 104R, XV Intermediate V, sketch, XV. Agg. V. description, Nov. 17, 102R, sketch, XV. Agg. V. before attack, Nov. 7, 22, Nov. 15, 105, Nov. 17, 104R, 105R. V. after attack, Nov. 7, 23. V. common during particularly prolonged dispute, Nov. 15, 105Squint During V, Nov. 17, 102RHF. Description, Nov. 7, 22, Nov. 22, 116LCN's on Ground. Accompanied by HD int. movs., Nov. 7, 24, Nov. 14, 102. From V posture, Nov. 17, 103RL.C. Performance General description, Nov. 7, 23, Nov. 17, 102R, 103R. Description call itself, Nov. 7, 23, Nov. 14, 102, 103, Nov. 18, 106R. Diagram whole call, Nov. 14, 103. With prelim. notes in HD, Nov. 14, 104. Rare performances with prelim. semi-O before HD-O, Nov. 18, 106R. HD notes similar to M notes of other species, Nov. 14, 103. Rare HD phrases with 3 notes instead of 2, Nov. 18, 106R. HD posture, description, Nov. 7, 23, Nov. 16, 106, Nov. 17, 103R. sketches, Nov. 7, 23, Nov. 16, 106, XVII. Diagram O notes, Nov.



Whole L.C. common during violent disputes, often before attack; Nov. 15, 105; Nov. 17, 102R

belcheri.

INDEX, 1955-56

7, 23, Nov. 14, 103. O posture, description, Nov. 7, 23, Nov. 14, 103; Nov. 17, 103R; sketch, Nov. 14, 103. Very short-necked O postures, sketches, Nov. 17, 104R

→ Circumstances. O before attack, Nov. 7, 23. General rôle in M.C.'s and other relationships between mates, see M.C. Unusual display by bird on ground toward flying mate, Nov. 14, 104; toward any flying bird, Nov. 15, 105

Choking General description, Nov. 7, 24, Nov. 15, 105. Nov. 17, 102R; Nov. 19, 106R. Sketches, Nov. 7, 24; XVII. Low intensity, description & sketch, Nov. 17, 102R. Ch postures almost identical with Gosts, Nov. 19, 106R. With bill closed, Nov. 19, 106R. General weakness of sound, Nov. 19, 106R. "Int. Moves" of Ch; M posture, or G in V and/or Gost, Nov. 15, 105. "Int. Moves" without subsequent Ch; Nov. 15, 105. Ch. common during violent disputes, Nov. 15, 105. Before attack, Nov. 7, 23. Before and after squat, Nov. 19, 106R.

Squat Description, Nov. 17, 103R; plus freeze, Nov. 17, 105R. Sketch, squat going into Ch; XVI. Squat before & after Ch; Nov. 19, 106R

Possible Pair-formation. Comment. Nov. 16, 107

M.C. V+HF, Nov. 7, 22, 23; Nov. 14, 102, 104. V+HF+Gosts, (in varying sequences), Nov. 14, 102, 104; Nov. 17, 103R. HD-O-V+HF, (in varying sequences), Nov. 14, 102, 104. HD-O-V+HF+Gosts (incl. PAG, etc.), (in varying sequences), Nov. 14, 104. M.C.'s involving Ch, Nov. 14, 104. General discussion usual M.C. sequence, with commonest variants, Nov. 15, 105. HD-O's by bird on ground as partner flies in; Nov. 14, 102; Nov. 17, 103R. V+HF by bird on ground as partner flies in, Nov. 16, 106

♂ Attacking ♀ During M.C.'s and related displays, Nov. 16, 107. Hostility redirected upon mate. Provoked by intruder, including HD, O, and Ch; Nov. 17, 104R.



*Lelcheri.*

INDEX, 1955-56

T. Description; Nov. 14, 104, Nov. 16, 106, 107.  
♀ F.B. Description; Nov. 16, 106, Nov. 17, 104R.  
♂ Regurge Description; Nov. 16, 106, Nov. 17, 104R.  
Relative Rarity of M. Nov. 17, 104R.  
Pre-Cop. Displays. Nov. 16, 106, 107.  
Copulation. Description; Nov. 16, 106.  
Post-Cop. Displays. U & HF, Nov. 16, 106.

*Larosterna inca.*

INDEX, 1955-56

## GENERAL

Physical Description of the Birds. Nov. 10, 30, 37, 39, Nov. 11, 49, 50, Nov. 13, 75, Nov. 14, 78, Nov. 15, 89, Mar. 13, 291, Mar. 15, 299, 300.  
Sketches; Nov. 10, 30, 39, Nov. 15, 92. Appearance in air; Nov. 10, 32, 39, Nov. 15, 92.  
General Comparison Inca Tern and S. American Tern. Jan. 3, 230, 231.  
General Comment on Colony in Pre-breeding Phase. Nov. 10, 28, 29, Nov. 14, 76, 77, 80, 81, Nov. 16, 101, Mar. 12, 288, Mar. 13, 290, 291, 292, Mar. 14, 295, Mar. 15, 298, 299, 300. Are there 2 breeding seasons per year? Mar. 12, 288.  
General Comment on Aggressiveness. Nov. 11, 46, Nov. 12, 56, 62, 63, Nov. 15, 92.  
General Comment on Territorial Disputes. Nov. 13, 70, 74, Mar. 14, 295.  
General Comment on Hostile Displays. Classification; Nov. 11, 51. Functions; Nov. 11, 51. General note on counts; Nov. 11, 51. Lack of display by attacked birds before being attacked; Nov. 13, 73. Rarity of displays toward flying birds; Nov. 13, 75, Nov. 15, 88.



## inca. INDEX, 1955-56

## JUVENILE BIRDS.

Hostility in Communal Areas Remarkably aggressive, Nov. 11, 50, Nov. 16, 98.

Beginning (?) of Territorial Defense By nearly adult bird, Nov. 16, 99.

Begging FB, HB in H+R, Mar. 12, 289; Mar. 14, 295, 296.

Hostile Juvenile Notes "Begging notes", in peculiar F+HB, toward pot. pred, Mar. 14, 295, 296.

Hostile Displays like those of Adults Agg V, Nov. 11, 45. St. after attack, Nov. 11, 45. Rasp & low O before attack, Nov. 11, 50. Aerial Rasp, Nov. 14, 80.

## AERIAL PATTERNS OF ADULTS.

General Comment Aerial Hostility Nov. 16, 99.

Silent Panics Description, Nov. 8, 25; Nov. 13, 63; Mar. 13, 291. Remarks on the comparative frequency of Silent Panics in this species, Nov. 10, 28; Nov. 11, 50; Nov. 15, 88, 89; Mar. 14, 295. Silent Panics "triggering" visits to colony area during pre-breeding phase, Mar. 13, 291.

Enatic Flights During Silent Panics, Nov. 13, 63; Nov. 14, 81.

Flight of the birds starting Silent Panics, Nov. 14, 82.

Circling With Moth Flight and LCN's, Nov. 10, 32. With Butterfly Flight, LCN's, G's, and "Hanging" postures, Nov. 14, 81.

Pursuit Flights Possible pursuit flights at beginning of breeding season, Mar. 12, 289, 290; Mar. 13, 292, 293; Mar. 14, 297; Mar. 15, 299. Real pursuit flight with swoop & soar, Mar. 15, 299. Pursuit flight with St. and Rasp, slightly reminiscent of "passing" in Herna, Nov. 10, 31. Moth flight by pursuer, Nov. 10, 34.

Swoop and Soar With pursuit flight, obviously inverted, Mar. 15, 299.



Unritualized Flying Posture. Sketch, Nov. 12, 62.

Aerial Stretch. Sketches, Nov. 10, 31; Nov. 11, 48; Nov. 14, 78. Common during Silent Panics, Nov. 14, 79. By escaping bird, Nov. 10, 31. Aerial St. with ordinary wing-beats, Nov. 10, 30; Mar. 13, 292; Mar. 15, 299. With Moth Flight, Nov. 10, 30; Nov. 11, 42, 49, 50. Sketches, Nov. 12, 54. Circumstances. During Silent Panics, Nov. 11, 44; Nov. 15, 91. After fights, Nov. 12, 60; Nov. 16, 99; Mar. 13, 299. By winners of fights, Nov. 12, 61; Nov. 13, 68; Nov. 16, 98; Mar. 13, 292. By obviously aggressive birds, Nov. 11, 45, 46, 49. During circular flights, Nov. 13, 65. By ♀'s during pairing, Nov. 15, 95. General comment on circumstances of St + Moth Flight, Nov. 12, 54. St. + glide; Nov. 8, 26; Nov. 11, 42, 45. General tendency of Moth Flight to develop into glide, Nov. 16, 99. Is St with Moth Flight more aggressive than St. with unritualized flight? Nov. 14, 79. St + G; Nov. 12, 54; Nov. 15, 91. Semi-St + G before attack, Nov. 14, 85. St. with Rasp, Nov. 10, 31.

Aerial Gaping. Description, Nov. 10, 35; Nov. 16, 99. Sketch, Nov. 16, 99. With Moth Flight + St., Nov. 12, 54; Nov. 15, 91.

Buoyant Flight. Description. Low intensity buoyant flight, Nov. 13, 64. With G and "Hanging" Posture, Nov. 14, 80. With G's, "Hanging" Postures, and Rasps; Nov. 14, 81. During possible pursuit flights, Mar. 13, 290.

"Hanging" Posture. Sketches, Nov. 14, 80, 81, 82.

Butterfly Flight. Description. During possible pursuit flights, Mar. 13, 292. Extreme Butterfly Flight with G's, "Hanging" Postures, and Rasps, during circling, Nov. 14, 81. General discussion of the differences between buoyant and Butterfly flights, Nov. 14, 81, 82; Mar. 13, 292, 293.

Simple Moth Flight. Description, Nov. 13, 65. Posture, sketch, Nov. 15, 93. After fights, Nov. 10, 31; Nov. 11, 48; Nov. 15, 93. By pursuer during pursuit, Nov. 10, 34. Before attack, Mar. 13, 292.

Aerial Rasp Posture. Description, Nov. 10, 32; Nov. 13, 70; Nov. 14, 77.



inca.

## INDEX, 1955-56

Mar. 15, 300. Sketches, Nov. 10, 32; Nov. 13, 70; Nov. 14, 77; Mar. 15, 300.

Aerial Attack Call. Apparently a modification of Rasp, (with "wh"). Nov. 9, 27; Nov. 10, 35; Nov. 12, 63; Mar. 12, 292. General discussion, Nov. 14, 82.

Rasp with "Hanging" Posture and "Normal" Wing-beats. Mar. 15, 299.

Aerial Alt Posture. Description, Nov. 10, 32; Mar. 15, 300.

Frequency of Aerial Alt. Common at the very beginning of the breeding season, Mar. 13, 293. Rare during the height of the breeding season, Nov. 16, 100.

High-pitched loud screaming noise. As silent panic declines, Mar. 13, 291.

Absence of High Flight. Mar. 14, 297.

Absence of Fish Flight. Nov. 14, 81; Mar. 14, 297.

Circular Flights. See pairing references. Description, Mar. 13, 292; Mar. 15, 298. Relatively rare at very beginning of breeding season, Mar. 15, 298. General comment, Nov. 13, 65; Nov. 15, 95.

Aerial Fish-Carrying. Sketches, Nov. 11, 48; Nov. 13, 66.

Absence of Landing Call. Nov. 11, 44. Use of Rasp as a "substitute", Nov. 14, 79.

Absence of "real" A.C. Nov. 11, 44. Brief, "mothered", chit as a "substitute", Nov. 12, 59; Nov. 14, 79; Nov. 16, 100. Brief, loud, chit as a "substitute", Mar. 14, 295.

## PATTERNS OF ADULTS ON THE GROUND

Fighting. Description, Nov. 12, 58, 62; Nov. 13, 67. Sketches, Nov. 12, 62; Nov. 13, 65.

Reaction of colony to long violent fights. Lillie B. h. g., Nov. 12, 62.

Hostile OCB. Nov. 11, 50.

Hostile Head-shaking. Nov. 11, 50.



## inca. INDEX, 1955-56.

Hostile Preening. General comment, Nov. 11, 50. During V-complex, M.C.'s, Nov. 15, 95. As response to Begging, Nov. 10, 39.

V. General description, Nov. 14, 80. Low intensity forms, Nov. 10, 35. Not very contagious, Nov. 12, 60. Presenting back of head to partner during V-parading, Nov. 15, 95. General discussion motivation, Nov. 15, 90.

Agg. V. Description, Nov. 8, 26, Nov. 12, 53, 58. Sketches, Nov. 8, 26, Nov. 10, 34, Nov. 11, 46, Nov. 12, 53, 58, XI. Most extreme agg. V's during M.C.'s, Nov. 12, 53.

Aux. V. Description, Nov. 10, 30, Nov. 15, 89, 94. Sketches, Nov. 10, 34, Nov. 12, 53, XII.

V's & G. During parading, Nov. 14, 77. Sketch agg. V & G, XI. Sketch aux. V & G, XI.

Intermediates between agg. V and G, description and sketches, Nov. 12, 58; XI.

Semi-V common after Ch, Nov. 10, 35.

HF. Description, Nov. 10, 30, Nov. 13, 69. HF a low intensity pattern, Nov. 10, 35. HF + St, Nov. 12, 54.

Tilting. With HF's, Nov. 13, 69.

St. Description, Nov. 8, 26, Nov. 10, 28, 38, Nov. 15, 90, 91, 94, Nov. 16, 97. Sketches, Nov. 8, 26, Nov. 10, 36, 38, Nov. 11, 41, 51, Nov. 13, 67, 75. Resemblance to  $\emptyset$ , Nov. 10, 28. Possible differences between "real" St and silent  $\emptyset$  or LCN, Nov. 10, 38, Nov. 11, 41, 51. St + HF, Nov. 12, 54. St. + side-to-side head-turning, Nov. 12, 61. General discussion of sign stimuli hidden or revealed by St, Nov. 16, 97.

Circumstances. Not very contagious, Nov. 12, 60. A low intensity "greeting" by landing bird after landing near other birds, or by one bird on ground when another bird lands nearby, Nov. 10, 28, 38, Mar. 14, 294.

Produced by low intensity motivation, Nov. 10, 35.

General discussion of the relationship between St. and the V complex, Nov. 15, 90.



mca. INDEX, 1955-56

Gost Description, Nov. 10, 30, Nov. 14, 86, Nov. 16, 97, Mar. 12, 288. Sketches, Nov. 14, 86. Resemblance to ~~●~~, Nov. 10, 30. Intermediates between gost and agg. V, description + sketches, Nov. 12, 58, ~~VI~~ Circumstances. Not very contagious, Nov. 12, 60. Produced by low intensity motivation, Nov. 10, 35. General discussion of the relationship between Gost and the V complex, Nov. 13, 90. General discussion of the relationship between Gost and the Cht complex, Nov. 10, 31, Nov. 16, 97.

Cht. General description, Nov. 8, 25, 26, Nov. 10, 33, 36, 38, Nov. 12, 54, 55, 60, Nov. 14, 87, Nov. 15, 91, Mar. 13, 292. Circumstances. Very contagious, Nov. 12, 60. Relatively common during brief visits to the colony area at the very beginning of the breeding season, Mar. 14, 294. As silent Panics decline, Nov. 8, 25, Mar. 13, 291, 292, 293 after LCN's after silent Panics, Nov. 13, 49. By aggressive bird in flight, Nov. 11, 45. Usual display, (particularly F + Cht), by bird on ground toward flying birds, Nov. 10, 31, 36, Nov. 11, 46. Motivation. Less aggressive than Rasp, Nov. 9, 27. General discussion of the evolutionary significance of alternating ~~●~~'s & F's, Nov. 14, 77.

Cht. from agg. V, Nov. 10, 35.

Cht. in H + R, Nov. 10, 34.

Peculiar, long-drawn, muffled variant of Cht in semi-V - semi-Gost, Nov. 12, 54.

●. Description, Nov. 12, 59, Mar. 14, 294. Sketches, Nov. 8, 25, Nov. 12, 59, Nov. 13, 47, Mar. 14, 294. Resemblance of ● to St, Nov. 10, 28.

F. Description, Nov. 10, 28, 34, Nov. 11, 49, Nov. 14, 76, Nov. 16, 96. Sketches F posture, Nov. 10, 29, 34, Nov. 11, 49, Nov. 14, 76, 78. F + Cht often directed toward distant birds, Nov. 10, 28. Definite muffled Cht by ♂ carrying fish in F, Nov. 13, 94. For other references to F + Cht in pursuing and sexual situations, see below. F + Cht a relatively low-intensity Cht pattern, Nov. 14, 78.



• Description, Nov. 12, 60; Nov. 13, 74; Nov. 14, 86, 87.

By captive bird, Nov. 21, 113. Sketches, Nov. 13, 65, 74; Nov. 14, 86, 87; XII. Resemblance of • to goit, Nov. 10, 30.

F+G Description + sketch, Nov. 14, 85.

Rarp. Description, Nov. 8, 26; Nov. 9, 27; Nov. 10, 28, 29, 35; Nov. 11, 52; Nov. 13, 75; Nov. 14, 79; Nov. 15, 92; Mar. 12, 289. Varying down to inaudibility, Nov. 11, 46. Sketches Oportuna, Nov. 10, 40; Nov. 13, 75; Nov. 14, 79; XIV.

Very effective as threat, Nov. 11, 46.

Circumstances. Very contagious, Nov. 13, 60. Relatively common at height of breeding season, relatively rare at the very beginning of the breeding season, Mar. 14, 294. By escaping bird, Nov. 13, 70. Before flying up, Nov. 15, 92. As silent panic declines, Nov. 8, 25, 26; Nov. 11, 43; Nov. 12, 55; Nov. 13, 49; Nov. 14, 80; Mar. 15, 300. By neighbors during violent disputes, Nov. 10, 39. Pet. pred. reaction, Nov. 10, 32; Nov. 12, 56; and see Counts. During aerial fights, Nov. 13, 74; Nov. 16, 96, 98. With st. in air, Nov. 10, 31. Aerial Rarp is generally the same intensions as aerial LCN's of gulls, Nov. 14, 81. Rarp before attack, Nov. 16, 100.

Motivation. More aggressive than cht., Nov. 9, 27.

Gaping (as silent Rarp). Description, Nov. 10, 28, 30, 38; Nov. 11, 49; Nov. 12, 55; Nov. 13, 67, 74; Nov. 14, 79, 84; Nov. 15, 94; Nov. 16, 98; Mar. 15, 300. Sketches, Nov. 11, 49; Nov. 12, 55; Nov. 14, 77, 84; XIV. V or O + G sometimes appearing to be almost an alarm reaction, Mar. 14, 294; Mar. 15, 300. V or O + G apparently produced by lower intensity motivation than Rarp, Nov. 10, 38.

General Comment Pair-formation. Mar. 14, 295; Mar. 15, 298.

Possible Pair-formation. General comment, Nov. 15, 91. Fish-carrying ♂ displaying with 2 ♀'s; ♀ displaying with 2 ♂'s; Nov. 10, 40.

Behavior of Solitary Fish-carrying ♂'s. Description, Nov. 10, 28, 35, 36,



INCA. INDEX, 1955-56

39, 40; Nov. 11, 47; Nov. 12, 56, 60; Nov. 13, 69; Nov. 14, 78, 84; Nov. 15, 88, 92; Nov. 16, 98; Mar. 13, 292; Mar. 14, 296; Mar. 15, 298. Capture bird, Nov. 22, 115. Particularly good examples, Nov. 12, 56; Nov. 13, 71. Fish-carrying ♂'s frequently attracted by soliciting ♀'s; Nov. 14, 83; Nov. 15, 88. Sketches fish-carrying posture; Nov. 10, 40; Nov. 11, 42; Nov. 13, 69; ~~F~~. Possibly significant General Shakes by fish-carrying ♂'s. When ♀ is absent, Nov. 15, 94.

Hostile Response of Neighbors toward Fish-carrying ♂'s. Description, Nov. 15, 95; Mar. 13, 292; Mar. 14, 296; Mar. 15, 298.

General Comment on Displays between Mates. Nov. 13, 73.

Mutual Display between Mates involving Fish. Description, Nov. 10, 35, 36, 40; Nov. 11, 43, 47; Nov. 12, 59, 61; Nov. 13, 66, 69; Nov. 14, 83, 88; Nov. 15, 91, 93, 94; Mar. 14, 296; Mar. 15, 300. Best incidents, Nov. 10, 36; Nov. 11, 47; Nov. 13, 71, 73; Nov. 14, 85; Mar. 15, 300. Involving actual attack by ♂; Nov. 10, 37; Nov. 14, 83, 87. Involving actual attack by ♀; Nov. 15, 93. General comment, Nov. 14, 85, 86.

♂ Fish-presentation Call. Nov. 14, 85.

"Searchers". Description, Nov. 13, 68, 69, 71; Nov. 14, 82; Nov. 15, 95. Rare at very beginning of breeding season; Mar. 15, 298. Sketch semi-F-semi-L posture of some "searchers"; Nov. 13, 68.

Mutual Displays between Mates not involving Fish. Description, Nov. 9, 27; Nov. 10, 29, 30, 32; Nov. 11, 42, 44, 45, 46, 48; Nov. 12, 52, 59, 62; Nov. 13, 66, 69; Nov. 15, 88, 89, 95; Nov. 16, 96, 97, 98; Mar. 13, 291; Mar. 14, 294. Also see Counts. General discussion of the usual sequence of displays, Nov. 14, 77, 80. M.C.'s involving actual attacks by ♂'s on ♀'s; Nov. 16, 97; Mar. 15, 297. Most extreme agg. O's during M.C.'s; Nov. 12, 53. Greatest relative frequency of U-pairing at very beginning of breeding season; Mar. 13, 291. General importance Ch. - U sequence; Nov. 9, 27; Nov. 10, 32.



V-Parading as definite sign that Pair has been formed (several references).

♀ Begging. General comment, Nov. 15, 95. Description in H+R, Nov. 8, 26; Nov. 9, 27; Nov. 10, 28, 37, 38; Nov. 11, 42; Nov. 12, 53, 61; Nov. 13, 70; Nov. 14, 83, 84; Nov. 15, 88; Mar. 13, 292. Sketches H+R, Nov. 10, 38; Nov. 12, 61; Nov. 13, 64; Nov. 14, 83. Description begging in perfect F, Nov. 15, 93.

H+R without Begging. Mar. 12, 288.

F. Introduction to H+R. During begging.

Hostile Reactions by ♂ to ♀ Begging (H-F) + R — goats, (the nearest thing to mutual begging that I saw), Nov. 12, 60. Intermediate V, + Goats + OCB, Nov. 10, 28. Agg V, + HF + retreat, Nov. 10, 38. "Nervous" preening, Nov. 10, 39.

Absence of Mutual Preening between Mates. Mar. 15, 302.

Redirected Hostility, provoked by neighbors or intruders and vented upon Mate. Common. Description, Nov. 10, 33; Nov. 11, 44; Nov. 12, 56; Nov. 13, 65. Facing potential nest-site, Nov. 12, 56.

Mutual Chit performances not resulting from Redirection. Nov. 11, 47.

Redirected Hostility, provoked by mate and vented on neighbor. Rare. Description, Nov. 14, 78. Only in connection with V-parading, Nov. 16, 97.

Apparent Nest-site Selection. Description, Nov. 11, 43, 44; Nov. 12, 55; Nov. 13, 67, 74; Nov. 14, 82; Nov. 15, 92; Mar. 13, 291. By apparently unmated ♂, Nov. 12, 57; Mar. 13, 291. Away from colony area, Mar. 14, 294.

Pre-Cop Displays. Examples ♀ begging in H+R, Nov. 9, 27; Nov. 10, 28, 33, 37; Nov. 11, 44; Nov. 14, 84. ♂ just holding fish in FO, Nov. 14, 84. ♂ presenting fish, Nov. 9, 27. Agg V by ♂, Nov. 10, 33, 37. Intermediate V by ♂, Nov. 10, 28. Agg V + by ♂, Nov. 11, 44.



*Inca.* INDEX, 1955-56.

Copulation. Description, Nov. 10, 28, 37, Nov. 11, 44, Nov. 13, 70.  
No Cop. Call, Nov. 11, 44.

Post-Cop. Displays. ♀ in agg. V, Nov. 10, 28. ♀ continues beg-  
ging, Nov. 10, 37. Mutual lit - ansv. V, Nov. 10, 29. ♂ in  
agg. V, Nov. 10, 33. ♂ in agg. V & HF's, Nov. 10, 37, Nov.  
11, 44. ♂ in agg. V & Gasts, Nov. 10, 33. Also see Counts.



albus 1957.

(1)

General Comment. Jan. 13, 385; Jan. 14, 385, 387; Jan. 16, 387; Jan. 18, 391;  
Mar. 17, 423, 425; Mar. 23, 437.

● Description of Birds. Sketch, general effect in flight, Jan. 14, 387.

Comparison with other Noddies. Mar. 17, 427.

Description of Voice. Mar. 17, 427.

General Comment Hostility. High intensity disputing, Mar. 18, 426. Aerial host-  
ility, Jan. 16, 389.

Yawns. Associated with Gorts; Jan. 15, 387.

"St". After attack, Mar. 27, 466.

Gorts. During high intensity disputes, Mar. 17, 425, 426. During MC's, Mar. 17,  
425, 426; Mar. 23, 436; Mar. 24, 437. Toward flying mate, Jan. 16,  
389. As response to accidental touch by mate, Jan. 15, 387. During  
mutual Pr., Jan. 16, 390. With P.C., Jan. 14, 386. Sketches; Jan. 15,  
388.

"Kwarrr". By flying birds, Jan. 13, 385.

"Whistle". Description; Jan. 16, 390.

B. General description, Mar. 17, 425, 426. Relationship to "tik" notes,



albus Cont'd.

(2)

Mar. 17, 425. As predator reaction; Mar. 17, 425, 426. Counterpounce;  
Mar. 17, 425, 426. During intra-specific disputes; Mar. 25, 438; Mar. 28,  
464. Peculiar B's of Johnston Island birds; Apr. 9, 467.

PC. General description; Jan. 14, 386; Jan. 15, 388; Jan. 16, 388; Mar. 17, 424;  
Mar. 18, 426, 427; Mar. 21, 433; Mar. 25, 438. Diagram of call; Mar. 17,  
424; Mar. 21, 433. Shuttles; Jan. 14, 386; Jan. 15, 388; Jan. 16, 389; Mar.  
18, 427; Mar. 19, 428.

General comment; Jan. 13, 385; Jan. 14, 386; Jan. 18, 391; Jan. 19,  
392; Mar. 17, 426. Display of color inside mouth; Mar. 29, 466.

In air, with normal flight; Jan. 13, 385; Jan. 16, 389. During  
aerial chases; Mar. 18, 427; Mar. 24, 437. With V-glide; Jan. 13,  
385; Jan. 18, 391; Mar. 19, 428; Mar. 28, 464. With swoop; Jan. 16,  
390. During aerial fights; Jan. 16, 389; Mar. 17, 424, 426. As Landing  
Call; Jan. 13, 385; Jan. 14, 386; Jan. 16, 388, 389; Jan. 19, 392; Mar. 17,  
424.

In ordinary standing posture on ground; Jan. 14, 386. With "O"  
Posture; Mar. 29, 466. With feather-ruffling; Mar. 18, 427. With  
neck stretched forward; Jan. 15, 388. With Gait; Jan. 14, 386. With  
wing-raising; Jan. 14, 386; Jan. 15, 388; Jan. 16, 388; Mar. 17, 424.

By birds on ground toward flying birds; Jan. 15, 388; Jan.  
16, 388, 389; Jan. 17, 390.

As part of M.C.; Jan. 14, 386; Mar. 17, 425, 426; Mar. 23, 436;  
Mar. 24, 437.

"MPC" Mar. 17, 426.

Ordinary PC during Cops; Mar. 17, 423.



Double Pair-Formation. Mar. 28, 463, 464.

Early Pairing Behavior. General comment & descriptions, Mar. 23, 436, Mar. 24, 437, Mar. 27, 463. "seekers", Mar. 23, 436. Role of circular flights and wandering flights, Mar. 23, 436; see also references under WF.

Aerial Chases. Jan. 16, 389, Mar. 18, 427. Behavior on ground after chases, Mar. 18, 428.

Mutualized Fisk Flight? Jan. 13, 385, Jan. 17, 390, 391.

High Flights. Low intensity, Mar. 18, 427. High intensity, Mar. 26, 457, 458. High intensity flights absent during clear calm weather, Mar. 27, 463. High flights intergrading with WF's, Mar. 28, 465; Mar. 30, 466.

WF's. General description & comments, Mar. 21, 433, Mar. 23, 436, 437, Mar. 24, 437, Mar. 27, 463, Mar. 28, 463, 464.

MC. General comment rarity, Jan. 13, 385. Descriptions, Jan. 14, 386, Jan. 15, 387, Jan. 16, 389, Jan. 17, 390, Jan. 18, 391, Mar. 17, 425, 426, Mar. 23, 436, Mar. 24, 437. Typical PC-MPC-goat-MW to Pr series, Mar. 23, 436, Mar. 24, 437.

Hostility Redirected at Mate. Mar. 18, 427, Mar. 25, 438.

TW. Descriptions, Mar. 23, 436, Mar. 24, 437, 438, Mar. 25, 438, Mar.



albus Cont'd.

(4)

26, 458; Mar. 29, 466. Shetili; Mar. 29, 466

Mutual Pr. Invitation; Jan. 13, 383; Jan. 16, 389; Jan. 17, 391; Jan. 18, 392.

General description; Jan. 16, 389, 390. Before Cops; Mar. 19, 428;

Mar. 21, 433. During Cops; Mar. 17, 423; Mar. 18, 428; Mar. 21, 433

Eye-closing by ♀ during Mut Pr. during Cops; Mar. 17, 424.

Copulations. General notes; Mar. 19, 428. Descriptions; Mar. 17, 423;

Mar. 18, 428; Mar. 19, 428; Mar. 21, 433; Mar. 27, 463. Cop. Call;

Mar. 17, 423.

Post-Cop Displays. Jests & Mutual Pr.; Mar. 17, 424.



Notes on the behaviour of the Black Noddy.\*

During a four-month stay on Ascension Island with the BOU Expedition, I had the opportunity to observe something of the habits of the Black Noddy <sup>*tenuirostris* \*</sup> ~~*Anous*~~ <sup>*Anous*</sup> about which very little appears to have been published <sup>Henshaw, Campbell & White, Macgillivray,</sup> ~~(Murphy)~~.

Like most of the seabirds of Ascension, with the notable exception of *Sterna fuscata*, the Black Noddy breeds more densely on the little stacks offshore than on the main island. Predation by feral cats is probably responsible for this, as will be discussed elsewhere in the expedition's publications. While it was possible to see something of the Noddies nesting on the smaller stacks, most of these nests were practically impossible to reach, or even approach. More convenient for study were the birds breeding on Boatswain Bird Island, a large islet/ 300 feet high and a few hundred yards across, lying close to the east end of Ascension. While many hundreds of <sup>Noddy</sup> ~~birds~~ nest here on the seaward-facing cliffs dropping vertically into the water, others can be easily watched at a distance of a few yards and <sup>the nests were</sup> ~~accessible~~, using a short ladder if necessary. Most of the observations to be described were made on a section of cliff on Boatswain Bird Island, the account being based on about 75 hours watching.

Breeding season.

One of the main purposes of the expedition was to ascertain the time of breeding of the birds of Ascension, including the famous 9.6 month cycle of *Sterna fuscata*. Information on this subject is still being collected by the party and will be published

\* Footnote Although formerly the various races of this species were separated into two species, *tenuirostris* and *minutus* (Peters, Murphy), Mayr and Serventy & Whittell have united them as *tenuirostris*.



later. During the period I was able to watch the Black Noddies (December to February) their main breeding was ~~XXXXX~~ at an end.

~~XXXXX~~  
On the study area 14 pairs had young unable to fly ~~XXXXX~~ on 16 January; a month later all but two of these young could fly and only one <sup>new</sup> pair had laid. However there were many other birds present, at peak times in the morning and evening over a hundred (Fig .1), and much courtship and fighting was seen though ~~XXXXX~~ few courtship feedings and only one copulation.

### Nesting.

The Black Noddy nests on Ascension on small ledges and protuberances on steep cliffs. Many of these sites are covered with a pad of dried guano, ~~sixed with a little fibrous material,~~ and this compact cake <sup>which</sup> often hangs down in curious stalactite forms <sup>averages</sup> beneath the ledges. As the coastal rainfall of Ascension ~~is~~ only a few inches a year, the guano of each nests is not washed off ~~(except where it is within reach of spray)~~ and each occupier of a ledge adds to the accumulation, which is sometimes inches thick, and often projects beyond the original ledge.

These nests sometimes break off from the underlying rock, which prevents them growing indefinitely. The guano accumulates because adults and, of course, young defaecate while standing on the nest. ~~(Murphy).~~

~~These "bracket nests" are typical of Black Noddies. In other parts of their range seaweed is a common constituent.~~

~~but on Ascension it is scarce and the commonest fibrous material~~  
*Imbedded in the guano are fish a few* and *were occasionally seen gathering them*  
~~in the nests were feathers, which the Noddies of both sexes~~  
*feather*  
~~gather, one at a time, either from the land or the water. On~~

returning to the nest platform the feather is dropped and then



either ignored or picked up and dropped again. The sideways depositing action so characteristic of other Larids was not seen by me, though subsequently noticed by N.P. Ashmole.

The only other nestbuilding movement was scraping, very similar to that described for the Black-headed Gull by Moynihan. The depression of the tail while scraping was particularly striking. *This action presumably helps to produce the shallow depression in the guano platform, in which the egg lies.*

#### Occupation of ledges.

Ledges which are in use as nests are defended by single birds or pairs against intruders, but in addition other sites are defended, even tiny knobs of rock where it seems impossible for a Noddy to rear a family. Some individual birds could be recognised by idiosyncrasies of plumage, and there were also a few I had colour-ringed. The behaviour of these birds showed that, at the time of year I was watching, the birds, apart from those with eggs and young, were <sup>not</sup> restricting their attentions to a single ledge but often visited <sup>two or more</sup> ~~different ones~~, sometimes in different parts of the cliff. Ledges were not visited at random, however, since the same ~~two or three~~ ledges would be visited on different occasions.

#### Fighting and threat behaviour.

The Noddies defend their ledges by displays and by actual fighting. They attack each other with their beaks, without using wings or ~~teeth~~ claws. Usually an intruder flees as soon as another threatens or advances towards it, but occasionally a proper fight ~~may~~ develop.

Sometimes a bird who is attacked (for instance a young



bird who cannot fly but has scrambled onto a strange ledge) will neither attack nor flee, but turns its head away from the attacker and points its beak downwards, allowing itself to be pecked on the nape without resisting. ~~when~~ ~~when~~ The posture reduces the chance of the bird being attacked.

This turning away of the head is almost identical with what the Kittiwake Rissa tridactyla does in the same circumstances (Cullen), except that the Black Noddy does not tuck its beak right beneath its breast, as the Kittiwake sometimes does.

Young Noddies, both downy chicks and juveniles, have a singular method of defending their nests when an intruder lands there. They peck at its legs and feet and, even though the <sup>other bird</sup> ~~the~~ ~~bird~~ may peck back, the young are generally successful in driving it away. It may be stressed that the young do not peck at the legs because they are the nearest part of the opponent; they clearly direct their attack towards them. Despite its effectiveness, this method is apparently used only by young birds.

When one approaches a breeding cliff the Noddies may remain on their ledges until one is a few yards away, but they usually start to utter a ~~rolling~~ <sup>frog-like</sup> rolling croak: "kik-krrrrr", which they repeat again and again. This call may be uttered from a ledge (Fig. 2) or in flight as they fly ~~around~~ in front of the cliff. The same call is sometimes uttered by a territory- (i.e. ledge-) owner when a ~~strange~~ <sup>strange</sup> Noddy lands nearby.

Another display which intruders evoke is the Gape (Fig. 3). With neck stretched upwards, and beak pointing down and widely open to show the bright orange-yellow inside <sup>and the base of the tongue raised</sup>, the bird turns



towards or advances at the newcomer. *The display may be maintained up to two seconds.*

When a bird lands on an ~~xxxxxx~~ ledge it often gapes in just the same way even if there is no other bird on the ledge. This "landing gape" occurred in all but 17 of a sample counted of 36 landings at ~~xxxx~~ vacant ledges, though sometimes the bill was only opened slightly. Juveniles who can fly are less likely to gape when landing than adults.

Another hostile action is Clucking: with neck and beak aligned and pointing upwards (Fig.4), the bird utters a chattering "kuk-kuk-kuk..." whose frequency is about 6 syllables per second and which lasts continuously for up to three or four seconds.

These ~~xxxxx~~ displays (apart from the landing gape) are other hostile behaviour including commonly seen mixed with actual attacks, though the croak is the of the three least likely to lead to an attack. All of them ~~xxx~~ also occur and more briefly more occasionally when a pair come together; perhaps such pairs

---

\* Footnote. I refer to two birds as a pair when they stand side by side on a ledge, quite relaxed.

---

are relatively new acquaintances. ~~xxxx~~ There is a further difference in detail in the gape when performed in response to the mate and to a rival. ~~xxxxxxx~~ Whereas the display is usually directed at the rival, in response to the mate the bird more often faces in some other direction.

There are several other gestures which ~~xxxxxxx~~ occur both in hostile situations and when a pair come together. Two of these are calls: a short strident "parp" and a more drawn-out "kahhhh". Neither is common, either between a pair or between rivals.

The Foot-look (Fig.5) lasts two or three seconds and is identical with the action discussed and illustrated by Goethe and



Moynihan in other Larids, where it is quite common in agonistic situations especially, according to Goethe, when the performer is rather frightened. Though at first I overlooked this movement it later became clear that it was one of the commonest actions whenever two Noddies landed near each other, whether mates or rivals or club-mates (see below).

Another common gesture between mates and rivals is what I have called Nodding. I have no way of knowing whether it is this action which Watson refers to as nodding in Anous stolidus, but the word exactly describes what the birds do. With neck stretched obliquely forwards and the bill about horizontal, <sup>(Fig. 6a)</sup> the ~~bill~~ <sup>head</sup> is <sup>with beak remaining closed</sup> nodded through an angle of 90 degrees or less <sup>(Fig. 6b)</sup>, ~~xxxxxxx~~ and quickly returned to the starting position, where it is held momentarily before another nod. The rate of nodding varies but at its highest intensity is about 3 times a second and lasts for two or three seconds.

After noticing the regularity of Head-shaking when a pair of Brown Noddies come together (see below), I found I had overlooked this movement, which occurs in encounters between Black Noddies mixed with nodding and foot-looks, though it appeared to me to be less regular than in the Brown Noddy.

To give a better idea of the frequency of the different <sup>the</sup> displays in different situations I noted the actions seen in a sample of encounters when two birds came together on a ledge. These encounters were classified as Hostile, when one bird drove the other away, and Greeting, when the two birds relaxed or went



off together in a display flight (see below). The hostile encounters were further divided into the performance of the attacking and fleeing birds. In the Greeting the performances of the two birds were <sup>on the average</sup> alike and are not therefore distinguished.

The table 4 shows the percentage of performances in each class in which a display occurred at least once. (Landing gaps are omitted because they are not part of the encounter situation. Head shakes are omitted because they were overlooked until too late.)

	Attacking	Fleeing	Greeting
Clucking	15	2	1
Croak	1	0	0
Gape (not landing gape)	21	19	3
Nodding	32	36	28
Foot-lock	20	20	27
"parp"	5	11	12
"kahhh"	0	0	4
Bridling	5	9	19
"kek"	0	2	6
No. of performances on which % based	75	44	221

Non-hostile displays between the pair.

One of the commonest ~~antitaxian~~ displays when a pair are together is Bridling. One bird, with body tilted slightly forward, jerks its head rhythmically backwards and forwards. As the head is drawn back, the bill is opened (Fig. 7), and then at once closed with an audible click as the head is thrust forwards again to a position shown in Fig. 8. ~~Therewith the bird makes a series of rapid~~  
The whole to-and-fro movement lasts ~~say~~  $\frac{1}{2}$  to  $\frac{3}{4}$  of a second and the two positions alternate smoothly sometimes for minutes, with only short interruptions. The display is quite silent except for the closing of the beak, which can



only be heard close at hand.

mates

Both ~~xxxxx~~ are able to bridle and occasionally both do it together for a short time, but usually one does it while the other watches. Unlike the other displays described so far, bridling often starts without any obvious external stimulus: a pair are standing quietly on a ledge, resting or preening, when one starts bridling and the other at once ~~stops~~ what it was doing to watch. Bridling usually dies down to nothing and the pair relax again. At other times the bridling is set off by a particular stimulus: for instance the arrival of another bird on a nearby ledge sometimes starts a single bird bridling.~~xxxxxxx~~

When a pair are together the bridling seems to have little effect beyond causing the mate to pay attention, though I have seen that it may make the mate approach closer to the displaying bird. ~~(I have also once seen it have the reverse effect on a rather nervous partner, but this may have been because the bridling bird pointed his head towards the other, instead of taking up the more usual lateral position.)~~ When a single bird is bridling this attracting effect is sometimes clearer, and I believe it is probably by means of this display that territory-owners attract mates and that one mate uses it to attract its partner to the nest site of its choice.

While bridling a Noddy sometimes utters a quiet, hollow "krrrrrrr...", lasting for many seconds and fluctuating in intensity according as the bill is opened or closed. Typically, however, this call seems to be uttered from a special Arched Posture, with neck arched and looking curiously inflated (Fig.9). This display



is much less common than the bridling but was seen in the same situations.

The bird who is not bridling may stand quietly by its mate, but it sometimes utters a short metallic "kek" every xxx seconds or two in an irregular way, from no particular posture. This may continue as long as the bridling continues and at the same time the Kakk kekking bird may show an interest in the mate's beak as if it would take any food regurgitated. I noticed  
this call



too late to see whether it preceded courtship feeding.

As might be expected from the behaviour of other Larids, courtship feeding closely resembles the way the parent feeds the young. I saw it too few times to do more than confirm this general resemblance, beyond adding that on one occasion the male adopted the arched posture and corresponding call before regurgitating.

On the only occasion I saw a copulation, the female assumed a hunched posture with body tilted slightly forward and with neck withdrawn, and the male preened her head for a minute or two before mounting.

This preening of the mate is not restricted to the minutes before copulation. Unlike the ground-nesting Arctic Tern, Noddies ~~Black Noddies~~ quite often preen ~~xxxxxx~~ their mates, parents or young. A similar difference is found in the gulls between the cliff-nesting Kittiwakes, which preen each other, and the ground-nesting species, which do not.

Two other calls should be mentioned. One of them resembles the croak, except that the first, short syllable is missing and the remaining roll is rather more drawn out. It occurs in a quite different situation from the croak, when a bird leaves its nest preparatory to flying away from the colony as if to feed. It is not given in response to alarm.

The other call is a rapid "kyer-kyer-...." uttered as a bird flies in to alight, after being away from the colony. For some reason not clear to me, it often evokes an outburst of croaking from other adults present in the colony.



### Aerial display.

Like other terns the Black Noddy has an aerial display, which I saw many times. ~~XXXXXXXXXX~~ It begins when a pair are together on a ledge. There may be ~~many~~<sup>a</sup> false starts<sup>or two</sup> when one or both birds make little circular flights in front of the cliff ~~and~~<sup>and</sup> ~~land~~<sup>land</sup> again, but eventually the proper performance begins, consisting of an ascent followed by a return to the nesting colony. <sup>During which</sup> The ascent, <sup>which</sup> may last only a few seconds or until they ~~xxxxx~~ are tiny specks in the sky, the birds keep close together and often look at each other. ~~xxxxxx~~ Much of the time they fly with peculiar wing-beats, more regular and rather faster than in normal flight, which carry them forwards more slowly than wing beats of this speed usually do; at times the birds almost seem to rise head to wind without progressing forwards at all. As the birds climb they usually sway a little from side to side about the flight path, the swaying being more or less synchronised between the two partners. The ascent is not in large circles as is usual in some other terns.

During the ascent one often hears a prolonged ticking sound, whose frequency is about 5 syllables a second, like the clucking but each syllable ~~is~~<sup>is</sup> less hollow and the rhythm more regular. I do not know whether one or both birds make this ~~xxxxx~~ call or what its significance is.

The ascent does not end abruptly, but changes gradually to the descent, with the birds flying at first horizontally or slightly downwards. After a few seconds the ascent may be resumed again for a while, before the final descent starts, at first



shallow and then more steeply, often in a fast glide, with the pair all the time keeping so close together that it is difficult to distinguish which is which as they swerve downwards.

During the ascent and descent it can often be seen that one of the pair is continually adjusting its position to keep near the other and to follow the side to side swaying movements which the other initiates. During flights I have followed for two or three minutes, it was sometimes the same individual which shadowed the other in the ascent and glide, but at other times the roles would change after a while. A rather similar swaying occurs during the glide of the aerial display (high flight) of other terns and I have suggested that it is due there to an overcompensation in the efforts of the shadowing bird to follow its partner's movements quickly enough. This is certainly not the explanation in the Black Noddy, for the swaying is initiated by the steering bird, as I call it, and not by the shadower. In this species the cause is uncertain.

At the highest point of the aerial performance one or both birds often shakes itself, just as a tern does when it flies up after bathing. To satisfy myself that this shaking was occurring at an abnormally high frequency, I watched birds flying to and from their feeding grounds, and saw only 12 shakes during observations on single birds totalling 3000 seconds ( $=0.4$  shakes/100 secs./bird). On the other hand when I watched 1462 seconds of display flight involving two birds at a time, 47 shakes were seen ( $=1.6$  shakes/100 secs. /bird). If it had been feasible to count shakes only during the period when the birds were at the top of the display



flight, the frequency would certainly have been much more than four times the rate in normal flight.

It was occasionally possible to watch the birds during part of their aerial display and, before or after, on the nesting cliff, so that the connection between the aerial and ~~xxxxxxx~~ "ground" ~~xxxxxxx~~ display could be pieced together. A display flight commonly began shortly after a pair came together on a ledge, and when it was all over the participants would return to alight in the colony again. Sometimes the two mates would land on different ledges, but if this happened one of them often started to bridle and the other would fly to it and the pair would stand together again quietly.

Parental care. Behaviour of the young.

The single egg is brooded by both sexes, <sup>as Margillivray reported, just</sup> as in other Laridae. <sup>third</sup> <sup>possessed by</sup> There are two brood patches, the median ~~one~~ ~~xxxxxxxxxx~~ the Arctic Tern and many gulls is absent. *Coutherp feeds, catina during incubation (Margillivray).*

The down of the ~~xxxxxx~~ chicks gives them an appearance very like their parents, black all over except for a white forehead. While most of the chicks of Anous stolidus are also dark, a small proportion are almost white; but I saw no such light chicks among the Black Noddies.

The juveniles are even more like the adults and most easily distinguished by their shorter beaks (Fig. 10).

The young are fed by regurgitation, like those of A. stolidus (Watson). When begging for food the young peck at the beak of their parents. The feathered young withdraw the neck, tilt the body forwards and utter a plaintive piping call every second or two. Smaller young pipe and peck, but the hunched posture is



less distinct.

<sup>will</sup>  
~~as~~ the parent regurgitates and a lump travels up its neck, the young bird inserts its beak between the basal halves of its parent's mandibles, usually crosswise, the tip projecting out the other side. As the bolus of food <sup>moves</sup> ~~is~~ ~~xxxxxx~~ ~~xxxxxx~~ into the parent's beak, it passes between the chick's open mandibles and is pulled out and swallowed.

Some of the nests are connected by ledges with other parts of the cliff and before the young can fly they begin to explore around the nest. At times they get themselves to places from which they cannot return and may be severely ~~pecked~~ <sup>pecked</sup> by birds onto whose ledges they find their way. At the cliff where I watched ~~xxxxxx~~ ~~xxxxxx~~ a juvenile appeared one day who must have come from higher up the cliff. It could flutter a little but could not fly well enough to regain its own nest. During the next two days the unfortunate bird scurried about my ~~xxxxxx~~ study area sometimes managing to get quite high but always being pecked or falling off. The third morning ~~it~~ <sup>it</sup> was dead, ~~its~~ <sup>its</sup> scalp torn open in two places.

Usually, however, the young do not get themselves into such difficulties and will not leave the nest or ~~xxxxxx~~ the safe ledges around it until they can fly, even if one touches them. Unless one can watch the young for several hours a day ~~it~~ <sup>it</sup> is difficult to know the ~~actual~~ <sup>exact</sup> age at which they first fly for, like the Arctic Terns, there ~~is~~ <sup>is</sup> a short period during which they will fly "spontaneously" but crouch if approached by a human being. The only chick whose exact age I knew allowed itself to be handled up to its 36th day ~~xxxxxx~~. My next visit



was on its 46th day, when it allowed itself to be touched by a stick without flying but flew "spontaneously" some minutes later. From the size and feathering of ~~the~~ other young when they flew, this individual would not seem exceptional and it seems probable that the young normally fly about their 7th week.

The young Noddies are very unsteady in their early flights and are particularly unskillful in returning to their nests, which so ~~now~~ or later they try to do. This difficulty must be partly due to the the strong wind which perpetually eddies around their nesting cliffs. Perhaps it is because these juveniles so often cause trouble by landing on the wrong ledge, that when one starts to fly around the cliff, it often sets the adults croaking.

Young noddies continue to depend on their parents for food after they can fly. ~~XXXXXXXXXXXXXXXXXXXX~~ On the three occasions when I saw colour-ringed juveniles begging after they could fly, it was always on their own nests and from the behaviour of unmarked individuals too it seems probable that while the young are at the colony they are only fed on their nests.

The young sometimes beg from adults not their parents but I doubt if they are ever fed, as the adults drive away <sup>such</sup> ~~young~~ if they approach, behaving quite differently to them and to their own young.

#### Clubs. Sunning.

There ~~are~~ <sup>were</sup> certain parts of the Noddy cliffs where the birds <sup>would</sup> ~~are~~ alight but which ~~are~~ <sup>were</sup> not defended like nest ledges, and often half a dozen birds or more would stand together <sup>there</sup> ~~At~~ these neutral



areas or "clubs" the birds show relatively little reproductive behaviour, but usually rest or preen or sun themselves. Occasionally a bird would fly from a nesting ledge to one of these clubs to rest. Gulls and other terns have similar resting places close to the colony which are used by off-duty birds throughout the breeding season.

The sunning posture of the Black Noddies deserves special mention. The bird ~~xxxxx~~ assumes this by extending one wing and ~~the~~ tail, and often ~~in~~<sup>a</sup> leg/ as well, in the stretching movement which Noddies share with so many other birds, but instead of relaxing at once, the posture is maintained for minutes at a time (Fig. 11). The bird is orientated so that the sun shines full on the spread wing and the head is inclined to the side so that it receives the full force of the sun. ~~xxxxx~~ The sunning posture is quickly given up as soon as the sun goes behind a cloud. It is clear that the behaviour is suited to absorb radiant energy, rather than to cool the bird, since the Noddies frequently resort to a sunny patch when they could sit in the shade close by if they preferred.



## DISCUSSION

- Although the matter is not settled yet, it seems likely that its  
feeds and does more of the bridling etc.  
is the male which

2. On this supposition about the sexes, the course of pair formation seems to be as follows. The male occupies a ledge which he defends against intruders and bridges there to attract females. When a female lands beside him the pair display together, the displays including some which are seen during hostile encounters. As in many other birds, the male <sup>sometimes</sup> shows overt signs of aggression mixed with his displays towards the newly arrived female, and she may ~~xxxx~~ be easily alarmed by him. The display flight, involving the cooperation of both partners, presumably cements the pair bond more firmly and after a time the mutual distrust subsides.



and the pair are more relaxed together. Even after the pair has formed, the definitive nest <sup>place</sup> ~~site~~ has not been chosen, as the pairs visit different <sup>sites</sup> ~~places~~ together in different parts of the cliff. <sup>decision</sup> The ~~ex~~ is evidently deferred until closer egg-laying, in which period also courtship feeding and copulation presumably become commoner.

This general pattern is not very different from the pair formation of other gulls and terns. One point may be mentioned: the selection of the actual nest site only after the pair has formed. This is what happens in the ground-nesting gulls and terns, but the Kittiwake pairs on its nest site, a difference thought to be due to the relative shortage of nest sites on cliffs. One must suppose that such sites are not in such short supply for the Black Noddy or else that "house-hunting" pairs can readily evict unmated males when the time comes.

3. ~~It is well known that the pair-formation and "greeting" displays of many birds involve the same postures and calls as occur in fighting behaviour. In some cases however ~~xxxxxxxx~~ there are differences in the orientation of the displays. Thus the friendly "triumph ceremony" between a pair of victorious Greylag Geese Anser anser is like a hostile ~~display~~ <sup>demonstration</sup> except that the mates display past, instead of at one another (Lorenz). The Black Noddy's <sup>hostile</sup> gape is another display which, used between the mates, tends not to be orientated at the partner as it is at a rival. The oblique and forward displays of the Black-headed Gull Larus ridibundus are more regular elements of the greeting than the Noddy's gape and the pair commonly perform them side by side.~~

\* a point confirmed by Macgillivray who observed the species nesting in trees.



3. The Black Noddy nests on cliff ledges at all its breeding stations in the Atlantic (except in the British Honduras (Salvin)) but in the Pacific and Indian Oceans it usually nests on the branches of ~~xxxxxxxxxxxxxxxxxxxx~~ trees. Unlike its relative, the ~~Brown~~ Noddy, it seems never to nest on flat ground, though sometimes resorting to low bushes in the absence of anything better (Munro). (Wilson & Evans were informed by Palmer, Rothschild's collector, that in Laysan, Lisiansky and Midway the species laid its egg on the sand like the Brown Noddy, but a photo in Rothschild's Birds of Laysan shows the bird nesting in bushes.

~~dealing with~~ ~~xxxxxx~~ this area  
In any case several recent papers ~~make~~ no mention of the habit Richardson & Fisher, Munro, Fisher & Baldwin, Fisher, Richardson and refer only to cliff-, ~~or~~ tree- or bush-nesting.)

There appears to be a further difference between the Black and Brown Noddies, namely in the nest itself. That of stolidus varies from a few straws or shells to a substantial pile of twigs or seaweed, but is never more than a rather shapeless pile of material, with a slight hollow on top. The nest of tenuirostris however is ~~more~~ <sup>generally</sup> compact, composed mainly of seaweed or the leaves of trees, and is plastered with droppings. Of 26 apparently independent accounts of the nests of tenuirostris in the literature, 14 ~~specifically~~ particularly mention that the nest material is cemented together with excrement, and 2 others show it in a photo without remarking on it. On the other hand of 34 accounts of the nests of stolidus only two mention the presence of droppings (Gilbert, quoted by Gould, and Bryan). It would seem therefore that tenuirostris defaecates on its nest more than stolidus. Has the habit perhaps become an integral



part of the nest-building behaviour of the Black Noddy?

While the difference in nest structure must result from differences in behaviour, including the choice of material, the details of the nest-building behaviour of the two species is too little known for a precise comparison.

Ascension may in fact be a rather unfortunate place to try and study the nest-building of the Black Noddy, because of the shortage of nest material. There are very few plants on the coastal stretches where the birds nest, and seaweed is virtually absent. As already mentioned, feathers were collected instead, but these were a poor substitute as they often blew off the ledge again. In some way s, then, the nests and the nest-building <sup>and some actions rare or missing \*</sup> may have been imperfect ~~for comparison~~. For instance, in a useful little account Macgillivray says that the foundation of the nest is made by folding limb Pisonia leaves on a kkak branch, "where they are arranged with the beak and trampled down with the feet". While one clearly cannot put too much weight on these words, it may be recalled that trampling on nest material <sup>to produce a level platform</sup> is a specialisation the Kittiwake has developed to help it to nest on cliff-ledges (Oullen). *Although trampling was not seen noticed on Ascension, this might have been because suitable nest material was absent.*

Footnote

- \* N.P. Ashmole has told me that he found a number of Black Noddies' eggs on Ascension which had rolled out of their nests.



The divergence between friendly and hostile displays has been pushed even further in the Arctic Tern, where ~~evolution has~~ <sup>has been exaggerated</sup> ~~exaggerated~~ a primary difference in orientation to produce the bent display (towards females) and the crouch (towards rivals).

4. Some peculiarities of the Black Noddy appear to be connected with its <sup>high</sup> ~~nest~~-nesting habits. <sup>(i.e. in cliffs or in trees)</sup>

Young of ground-nesting terns such as the Arctic and Common <sup>before</sup> can fly by the end of their fourth week. These species are about the same size as the Black Noddy (mean weights <sup>about</sup> 100, 130, 120 gms ~~xxxxxx~~ whose young respectively), ~~xxxxxx~~ do not fly till some three weeks later. Two factors must contribute to this difference (1) the necessity for the Noddy to delay its first flight until it can be sure of returning to its ledge and (2) the need for the ground nesting terns to fly as early as possible so as to avoid ground predators. A similar difference is found in the age of first flying of the cliff-nesting Kittiwake compared with ground-nesting gulls.

The absence of a cryptic plumage in the young is another feature attributable to the ~~xxxxxx~~ nest site safer from predators. ~~One may object to this that though the young of A. stolidus are~~ ~~equally conspicuous, this species sometimes nests on the ground.~~ ~~However the observations of Watson show that stolidus will build~~ ~~a substantial nest in a bush given suitable material and sites. Ixx~~ ~~Ground-nesting is apparently forced on the species through~~ ~~xxxxxx in some parts of its range xxxxxxxx the~~ ~~lack of such sites and in any case can only be permitted where~~ ~~ground predators are scarce.~~ <sup>on small islands</sup>

Elsewhere I have argued that the behaviour of terns with egg-shells, whether they carry them away or not, is adapted to the



need to conceal the position of the nest from predators hunting  
 by eye. If a <sup>half egg-</sup>shell is presented in the nest <sup>concave up</sup> ~~away~~ (for convenience,  
 the eggs belonging in the nest are removed), some species will  
 fly off with the fragment and drop it yards away, and do this  
 long before the eggs hatch. Species which do not carry away  
 shells brood them instead. The tests are continued until the bird  
 either removes the shell or sits on it. Four Black Noddies were  
 tested in this way (6 tests in all). The shell was never carried  
 away though in one test it was picked up and dropped beside  
 the nest so that it fell down the cliff. In the others the bird  
 brooded the shell. ~~xxxxxxxxxxxx~~ In its readiness to brood  
 an egg-shell rather than carry it away the Black Noddy again  
 resembles the Kittiwake in contrast with <sup>most</sup> ~~xxx~~ ground-nesting gulls  
 and terns. / \*

While the cliff ledges of the Black Noddy may be safer in  
 some ways, they bring dangers ~~unknown~~ to ground-nesters. When  
 pecked by another bird, a young ground-nesting gull or tern  
 either fights back or runs away. Young Kittiwakes and Black Noddies  
 cannot run away and instead both adopt a posture which appeases  
 the attacker.

There are two ~~xxxx~~ peculiarities ~~xxxxxxxxxxxxxxxx~~  
 whose significance is not clear ~~xxxx~~, namely the use of a  
 display (the landing gape) when landing at a vacant ledge, and  
 mutual preening, but since both Kittiwake and Black Noddy have  
 them while the ground nesting gulls and terns do not, <sup>it</sup> ~~xxxx~~ seems  
 plausible that they too are somehow connected with the nesting  
 situation.

\*The Kittiwake's shells may remain and get trampled into the nest, or get knocked off accidentally so that they  
 accumulate beneath the nest. Macgillivray mentions that the egg shells of the Black Noddy are found beneath the  
 nests.



In connection with the nesting adaptations of the Black Noddy, the Brown Noddy's position is less certain, nesting as it does both on the ground and in bushes or even trees. Are all these sites equally acceptable to the species, or should it be regarded as a ground-nester which is spreading into the <sup>bushes etc</sup> ~~area~~, or the reverse? In the Dry Tortugas, off Florida, one of the best known colonies, <sup>the noddy</sup> ~~noddy~~ occasionally nest on the ground (Longstreet, Dickinson) but this is quite exceptional (Sprunt). At an Australian colony Tarr noticed that the early nests were in bushes, the later ones on the ground, as if the bushes were preferred but could only accommodate a limited number. In other places where the birds nest on the ground this appears to be because there are no bushes available. But bushes are not always preferred to any other site since Gibson-Hill, discussing this matter, points out that on Christmas Island the Brown Noddy nests on cliff ledges, though dense vegetation runs right to the top of the cliff. So far as any generalisation is at present possible for the species as a whole, it appears that the bird prefers to nest off the ground, usually in bushes, but that it is much less reluctant to nest on level ground than the Black Noddy. In at least two respects, it shares some of the nesting <sup>peculiarities</sup> ~~adaptations~~ of the Black Noddy: the young are not cryptic and the fledging period is long (about 40 days according to Gibson Hill).

Before leaving the matter it may be pointed out that nesting in relatively inaccessible sites is not the only condition under which anti-predator adaptations such as cryptic plumage can be given up. An alternative is to nest on small islands where



~~XXXXXX~~

the predators are rare, and it may be this situation which is more relevant to the Brown Noddy.



In spite of these adaptations to its special life, the Black Noddy does not seem to be as accomplished a cliff-nester as the Kittiwake. For instance it apparently lacks any specialised nestbuilding behaviour to improve the nesting platforms and in connection with this N.P. Ashmole tells me he has found a lot of Black Noddy eggs which had rolled off nests.

4. At first sight there appeared to be little resemblance between the displays and postures of the Black Noddy and those Sterna species with which I was familiar. One of the most similar was the food-begging, which is what might be expected as this behaviour is very stable throughout the Laridae.

The foot-look, an unritualised posture in its form, is identical in other Larids, though it is a much more regular item in the Black Noddy's behaviour than in the ~~Arctic~~ ~~Arctic~~ terns's. ~~ixkxxx~~ The existence of a complex aerial courtship display suggests that it is homologous with the aerial courtship (high flight) of other terns and closer comparison confirms that there are general features in common in spite of a difference in detail.

The erect posture, which is found in almost an identical form in all the known terns, is unexpectedly missing in the Black Noddy - at least I cannot recognise any display as homologous unless it has drastically changed its function and form.

The hostile gaze might be an aggressive upright such as the gulls have, with the opening of the bill superimposed on it to increase the threatening effect. It occurs in just the situations when gulls adopt the aggressive upright.

The posture from which the croak is uttered resembles



the oblique of gulls and the corresponding posture of Sterna. The call given in this posture is much less similar when compared but it has the infectious quality of the long call of at least some gulls (Herring, Lesser Black Back, Kittiwake). Like the oblique and long call the croak is uttered in agonistic situations, though this applies to several other calls too of course. It would thus seem plausible that the croak is homologous to the long call and oblique posture of gulls and the equivalent of terns, but the matter is by no means certain.

The bridling is of particular interest as it is a peculiar and elaborate display, whose rhythmic head and neck movements are reminiscent of the choking of gulls. This resemblance is increased by the posture of the body with the breast slightly lowered. A rhythmic choking-like display has not been described in any other species of tern but this would be in line with one view of the derivation of choking, which is that it is a ritualised reduplication of the movement by which a bird drops a load of nest material. Apart from the Noddies, no other tern is known to collect beakfuls of nest material from a distance; what material the others use is picked up a piece at a time as the birds sit, or walk to and from their nests.

If the bridling has originated from the same source as the choking of the gulls, it has come to differ in several ways. Firstly it is silent (except for the mechanically-produced snap of the closing beak), lacking the muffled rhythmic call found throughout the gulls. Secondly the regular opening and closing of the beak is quite unlike the choking of any of the known gulls.



Perhaps this second peculiarity can be linked with the bright inside of the mouth, just as the open-mouthed choking of the Kittiwake, an unusual feature for a gull, may be connected with the brilliant mouth colour of which use is made in other displays.

The beak-hiding behaviour of the ~~Kitt~~ Black Noddy has been compared with that of the Kittiwake. Though the gulls and some of the terns have rudimentary, and sometimes ritualised, forms of this turning away, it has only been developed so elaborately in these two "altricial" Larids. Since the Kittiwake is certainly not more closely related to the Noddies than to the ground-nesting gulls, this beak-hiding must be regarded as an adaptive convergence.

Other postures and calls of the Black Noddy, the clucking, "parr" etc., may also be related to displays of other Larids but one would need evidence from more intermediate species to substantiate particular relationships.

5. ~~The behaviour of the Brown Noddy has been described in Watson's classic study, and there are two other members of the genus Anous. Almost more recent) by Gibson Hill, but the displays have not been investigated sufficiently nothing is known of the behaviour of A. tenuirostris and though the habits various accounts have been written of A. stolidus, little advance has been made on Watson's observations which are not sufficient for a detailed comparison ~~with~~ with the Black Noddy.~~

In view of this the few observations I could make on the displays of stolidus nesting around Ascension will be reported.

There is a gaping display identical with the Black Noddy's and it is performed in identical situations - when landing alone, when landing beside the mate and before attacking an intruder. The inside of the mouth is rather less bright than the Black Noddy's.



Several times when a pair came together I saw a "greeting" display which was noticeably different from the greeting of the Black Noddy <sup>and something like that described by Tarr</sup>. Both birds alternated a downward-looking posture, and a quick shake of the head with beak upwards. The rhythm of the two movements was about the same as the bridling of the Black Noddy. The head-shaking was just like ~~what~~ <sup>unlike Tarr's observation. Now the posture is apparently what I have called the gape</sup> what a bird does when its head is wet. The downward-looking posture was with closed beak, <sup>but I do not have further details.</sup> After coming together, pairs <sup>(this must be the Brown Gibson Hill description)</sup> were also seen to look at their feet, just like Black Noddies. Like Black Noddies they preen their mates and their sunning posture is just the same.

When disturbed from their nests they fly around a human intruder uttering a <sup>frog-like</sup> call which is <sup>rather</sup> similar to the croak of the Black Noddy but lacks the initial short syllable; ~~it reminded me of a clockwork toy motor car running for half a second.~~

~~xxxxxx~~ It has been described as a caw and is presumably the call given in the posture illustrated by Watson Pl. 2 Fig. 6.

Though ~~xxx~~ its nesting places on Ascension are apparently visited equally seldom by human beings, we found the Brown Noddy distinctly shyer than the Black <sup>but other accounts are not consistent in this difference (Crawfoot, Hall, Nicoll, Severtz & Whittell).</sup>

6.

All the species of gull whose behaviour is known feed their young by regurgitation but many terns carry fish held crosswise in their beaks and the young take <sup>them</sup> ~~it~~ directly. Only the Black Noddy (described here) and the Brown Noddy and Sterna fuscata (Watson, Gibson Hill) are known to feed their young by regurgitation. The method by which the young take <sup>regurgitated</sup> food differs from species to species. The Black-headed Gulls often take the food from the parent's



bill tip, sometimes after it has been thrown on to the ground and picked up again. The young Kittiwake on the other hand reaches its beak to take the food from the throat of its parent. The method described here for the Black Noddy is different again, with the chick's mandibles between and across the parent's. I have seen Sterna fuscata feeding <sup>small</sup> its young a few times and here the method was rather like that of the ground nesting gulls, with the chick pecking at what the adult lets slide down its beak.

Extending the comparison to the Pelicaniformes, one finds that young gannets ~~and~~ and cormorants ~~(Phalacrocoracidae)~~ insert their beaks straight into their parents' throats, even farther than the Kittiwakes, and, at least in Sula leucogaster and dactylatra, the older young tend to rotate the head about its long axis, which perhaps prevents the lower mandible from obstructing the passing of the food. Young pelicans and anhingas also take their food from their parents' throats but in the Tropic-birds, the fifth family of Pelicaniformes, the positions are reversed and it is the adult which puts its beak between the chicks open mandibles. The tropic-birds' method seems uncommon among birds in general, for in pigeons and various seed-eating passerines it is the young who insert their beaks.



*stolidus*

1957

(1)

General Comment Hostility Comparative lack of aggressiveness in 1957, Easter Island; Jan. 13, 397. Relatively few attacks in communal areas; Jan. 16, 410. LCWN's & aerial chases, instead of ground displays, before attacks; Jan. 16, 410. Position of carpi during ground displays; Jan. 17, 414. Longest fight; Jan. 19, 420.

Mutualized Pre-Attack Posture. Jan. 19, 420.

Possible Alarm Call ??? Jan. 19, 420. Apparent absence; Jan. 18, 416.

Displays by Birds on Ground Toward Flying Birds. Jan. 16, 411.

General Description N. Difference between high intensity and low intensity N; Jan. 16, 409; Jan. 18, 418. N intergrading with Ch; Jan. 15, 404.

Post. General Description; Jan. 19, 419. Associated with mutual preening; Jan. 16, 408. Developing into self preening; Jan. 19, 421.

V. General Comment; Jan. 14, 401, 402. Extreme aggressive V's; Jan. 16, 411.

Lsh. Lsh's occurring by themselves alone; Jan. 14, 402. Lsh's during Ch. taking the place of HFK during N; Jan. 14, 401.



stolidus Cont'd.

HFK Related to Lsh during Ch ?; Jan. 14, 398

G With Ch, general comment; Jan. 13, 397

L General comment; Jan. 13, 406; Jan. 16, 411. Description & sketches; Jan. 17, 414

Nervous Preening During intra-specific; Jan. 14, 398. During M.C.'s; Jan. 14, 398. As pot. pred. reaction; Jan. 12, 394

LCWN. Description; Mar. 21, 432. Usual display by birds on ground in communal area toward flying birds; Jan. 18, 416; Mar. 27, 463. Usual pot. pred. display; Jan. 18, 418. Used as "flying up" note; Jan. 16, 412. Role during pairing; Mar. 25, 442, 443. Difference from LCWN of the Black Noddy; Apr. 9, 467

SCW. Description; Mar. 21, 432; with tongue-raising; Jan. 13, 396. General comment; high intensity nature; Jan. 18, 417. Generally rare on Easter Island in 1957, due to lesser amount of fighting in colony; Jan. 13, 397. Usual call during aerial flights; Jan. 18, 418. Role during pairing; Mar. 25, 442, 443. Used to repel rape attempts; Jan. 12, 394; Jan. 16, 411. Given as "flying up" note; Mar. 25, 443. As start of Wandering Flight; Mar. 22, 435. Aerial SCW from ordinary flying posture; Jan. 18, 418.



R

Description, Jan. 12, 394; Jan. 14, 402; Jan. 15, 405; Jan. 16, 408; Jan. 18, 415; Mar. 20, 432; Mar. 22, 435; Mar. 25, 442, 443. Sketch elongate O Posture, Jan. 15, 405; Mar. 22, 435. Equivalent of Glik?; Jan. 14, 402. Low Intensity form, Jan. 12, 394. By ♀, during copulation, Jan. 15, 404. Associated with LWCN's; Jan. 14, 402. Relation to SCW, Mar. 25, 444. General comparison with R of Black Noddy, Mar. 25, 444.

Ch.

General Description & comments, Jan. 12, 393; Jan. 13, 395, 396; Jan. 15, 404; Jan. 16, 408; Mar. 20, 432. Relationship to M and regurgitation, Jan. 14, 403. With FB and feeding, Jan. 13, 397. Relation to nest-building, Jan. 14, 398. Used by mates during disputes with neighbors and intruders, Jan. 12, 394. General role during pairing, Mar. 20, 430. Intergrading with N; Jan. 15, 404. Role of Lsh in Choking, Jan. 13, 397.

Ch. Call. General description, Jan. 12, 393. As landing call, Jan. 14, 402. Relationship to SCW, Jan. 12, 394.

SCh With tail-raising, Jan. 15, 404

FR.

Jan. 19, 420

General Comment Pairing. Separate pairing & nesting territories, Jan. 18, 418. Possible pair-formation by aggressive or parading through communal area; Jan. 15, 405. Lack of standardized G.C.'s; Mar. 25, 442. Semi-territorial be-



behavior in communal area; Mar. 25, 440. Mobile parties and Wandering flights; Mar. 20, 429; Mar. 21, 432; Mar. 22, 433, 434, 435; Mar. 25, 439, 440, 442, 444. Changes during later pairing; Mar. 21, 433. General summary; Mar. 26, 461.

M.C.'s General comment; Mar. 23, 441. Behavior of apparently unmated ♂'s; Mar. 25, 442; Mar. 27, 462; Mar. 28, 465. ♀'s visiting several ♂'s in a row in communal area; Jan. 17, 414. Role of ch. in pairing; Mar. 25, 440. Particularly elaborate N-ch in communal area; Jan. 15, 406; Jan. 16, 409, 410; Jan. 25, 442, 443.

Hostility between Mates during Late Pairing; Jan. 14, 399.

FB and Feeding Description; Jan. 12, 395, 397; Jan. 14, 400; Jan. 16, 407. ♂ begging from ♀; Jan. 14, 402, 403; Relationship between FB and Mutual Preening; Jan. 14, 398.

Mutual Preening Before copulation; Jan. 14, 399, 400; Jan. 16, 408; Jan. 17, 413; Jan. 18, 415, 416. Without copulation; Jan. 14, 401, 403. During M.C.; Jan. 16, 409. ♀ soliciting preening by ♂; Jan. 18, 415. ♀ escaping from preening by ♂; Jan. 18, 415. Mutual preening with particularly strong hostility; Jan. 15, 407; Jan. 19, 419. ♂ preening ♀ during cop. itself; Jan. 15, 403, 405. Mutual preening associated with gasts; Jan. 15, 404. Mutual preening during incubation phase; Jan. 14, 401. Closely related to nest-building; Jan. 17, 412.

"Billing" General comment; billing movements during



Ch, FB, & Mut. Pr., Jan. 14, 402.

Copulation Description, Jan. 14, 399, 400, 403; Jan. 15, 404, 405; Jan. 17, 413. Cop Call?, Jan. 14, 401. Rape attempts, Jan. 12, 394; Jan. 14, 400, 401. General comment slowness & rarity of sexual behavior, Jan. 14, 400.

Nest-Building. General comment, beginning, Jan. 17, 412. During Cop. phase, Jan. 14, 399.

Permit Flights Involving aggressive or, possibly attempting pair-formation from communal area, Jan. 15, 405; Jan. 17, 413.

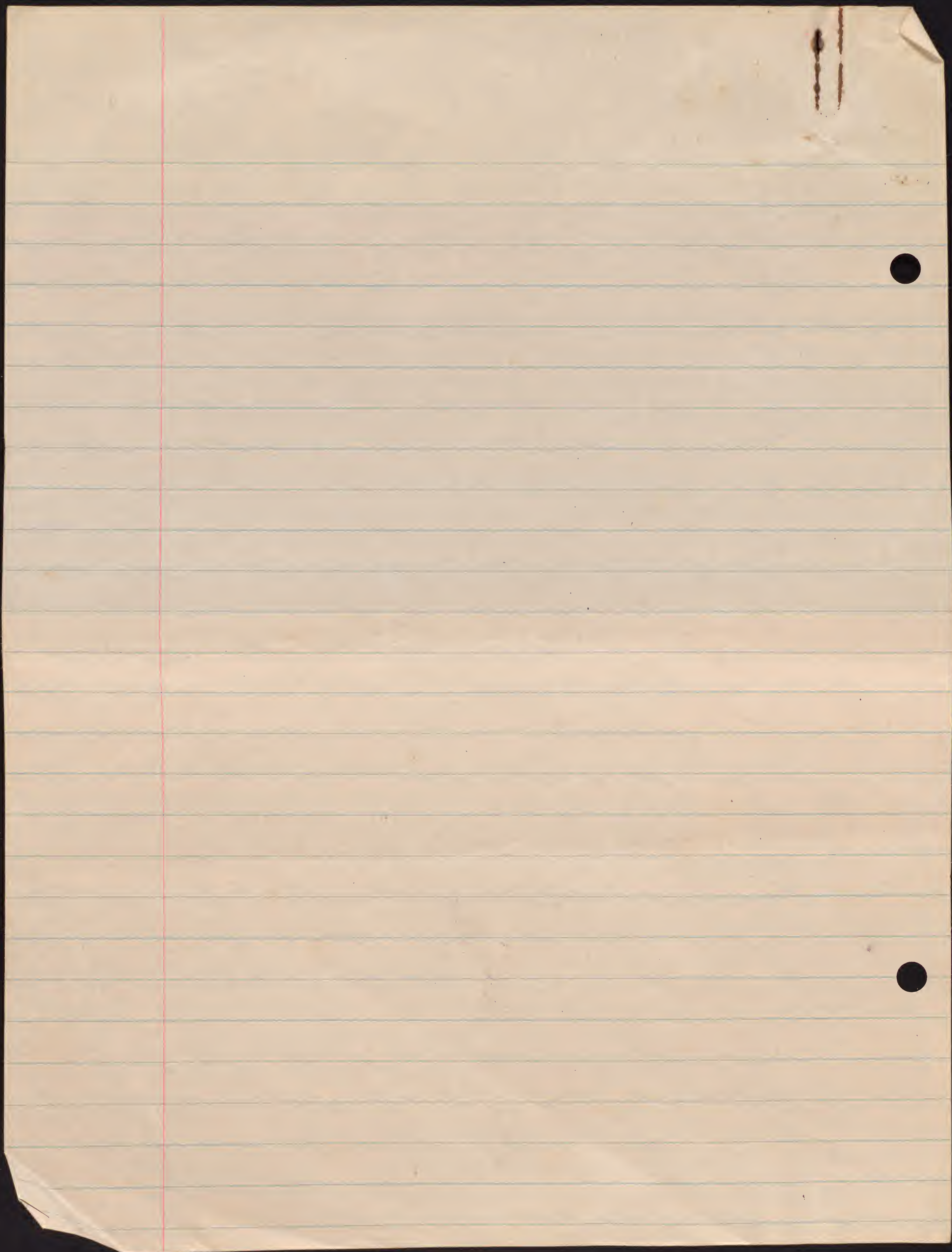
Aerial R. With permit flights, Jan. 17, 413.

Wandering Flights Mar. 20, 429, 430, 431.

Aerial gkk. Jan. 18, 417.

High Flights Description, Jan. 17, 413, 414; Jan. 18, 416, 418. Sketch, Jan. 18, 418. Beginning after mutual N between mates, Jan. 17, 414. As pot. pred. reaction, Mar. 18, 448. Absence during pair-formation, Mar. 20, 431; Mar. 23, 444.







(1)

*Larus scoresbii*, INDEX, 1955-56.

Physical Description of the birds Dec. 29, 210, 215; Dec. 30, 218; Jan. 2, 227; Jan. 6, 234. Sketch, XXVIII. Voice, Dec. 31, 1955.

General Notes Dec. 29, 210; Jan. 6, 235.

General comparative position of the species Dec. 29, 215

Pursuit Flight Unventualized; description, Dec. 30, 217 [Dec. 30, 216.

Silent Panic Description, Dec. 30, 216. Enatic flight, by juvenile, 1

Aerial LCN. Description of notes & accompanying postures; Dec. 29, 211.

Still something of a "generalized" frustration reaction (?), comments,

Jan. 2, 227. Circumstances: by birds flying near me; Dec. 29, 211;

by birds flying up from group; Dec. 30, 216; Dec. 31, 222; by bird

chased by Hairy Gull; Dec. 29, 211.

Aerial L.C. Description; Jan. 2, 227. Landing Call. No trace; Jan. 6, 234.

"Pure" attack Dec. 29, 210. GP. Dec. 29, 210; Jan. 6, 233.

"Pure" escape Dec. 29, 210.

U. Description, Dec. 29, 213, 214; Dec. 31, 222; Jan. 2, 226; Jan. 6, 233. Sketches; Dec. 29, 214; XXVIII. Comparison of U and T, particularly as post-attack patterns; Jan. 6, 233.

HF Description; Dec. 29, 213. Circumstances: after attack, usually with U, sometimes before T; Dec. 29, 213; Dec. 31, 222; Jan. 2, 226; after escape, Jan. 2, 227.

R. After attack, Dec. 31, 223.

Post, Jan. 2, 228.

Al.C. Description and circumstances; Dec. 29, 210, 211; Dec. 30, 216, 218.

Possibly more aggressive than the usual Al.C.'s of other species (?);

Dec. 29, 214.



Juvenile LCN. Description of notes and accompanying postures, Dec 29, 212. Circumstances: before attack; Dec. 29, 212; after attack; Dec. 31, 222. General comment, Jan. 6, 234.

Ground LCN. Description of notes and accompanying postures, Dec. 29, 212, 214. LCN's relatively rare, Dec. 30, 217. Burst of LCN's from semi-U, Dec. 29, 214; sketch, XXVIII. LCN with T movement, Jan. 6, 235. Some LCN's intergrading with al. C. notes (?), Dec. 29, 212. Peculiar "tuck tuck..." notes, probably related to LCN's, Jan. 6, 233.

Complete L.C. performances on the ground. Description of calls & postures; Dec. 29, 212, 213, 214; Dec. 30, 216, 217, 218; Dec. 31, 222, 223; Jan. 2, 226, 227; Jan. 6, 234. Sketches of O postures; Dec. 29, 212; Dec. 30, 218; XXVII. Sketches of HD postures, XXVII. Comment on the causal differences between O and HD, Dec. 31, 223. Description of juvenile L.C. performances; Dec. 29, 213; Dec. 31, 222. Comment on the possible evolutionary significance of the L.C. performance; Dec. 29, 214; Dec. 30, 318.

T. Description of movement and note, Dec. 29, 211, 213; Dec. 30, 217. Sketches, Dec. 29, 211; Dec. 30, 217. T movement with LCN, Dec. 29, 213; Jan. 6, 235. Possibly silent T movements, Dec. 29, 211. Intimidating effects, Dec. 30, 217. Circumstances: unmistakably hostile; after & after attack; Dec. 29, 211, 212, 213; Dec. 30, 217; before attack, Dec. 30, 217; after escape, Dec. 31, 222. A "short-distance" pattern, Jan. 6, 234. The usual reaction of birds on the ground toward birds flying close overhead, Jan. 2, 226; Jan. 6, 234. The T's of this species seem to "take the place" of the LCN's of other species, Dec. 30, 217; Dec. 31, 222. Comparison with the behavior of juveniles of other species, Jan. 6, 234. General comment, Dec. 31, 222.

Retention of pre-hoods Jan. 2, 227.



skua chilensis. November - December, 1956.

General Description Colony. Nov. 26, 342.

General Description Birds. Nov. 26, 342, 347, 352, 353, Nov. 28, 356, 368, Nov. 30, 373, Dec. 1, 379.

General Comment Hostility. Nov. 28, 356, 357, Nov. 29, 365, 370, Nov. 30, 371, Dec. 1, 379. Attack behavior generally like "large Larus" gulls, Dec. 1, 381. Relative frequency of attacks, Nov. 30, 376. General comment about the counts, Nov. 30, 376, Dec. 1, 380.

Silent Panic. Possible traces, Nov. 30, 373.

Aerial Alarm Calls. Description, Nov. 26, 354, Nov. 27, 354, Nov. 29, 364. Relative rarity, Nov. 26, 354, Nov. 29, 364.

Aerial Long Call Performance. General description, Nov. 26, 342, 353, Dec. 1, 378. General comment, Dec. 1, 378. From ordinary flight, Nov. 26, 353, comment, Dec. 1, 378, 382. From "upward flicking" flight, Nov. 26, 353. From simple glide, Nov. 26, 353, comment, Dec. 1, 378. With V-glide, Nov. 26, 353, Nov. 29, 364, 365, 370, Dec. 4, 383.

Aerial Long Call as Landing Call. Nov. 27, 354, Nov. 29, 370. With V-glide, Nov. 28, 358, Nov. 30, 374, 375. Mates landing together, with V-glide, Nov. 30, 375, Dec. 1, 380.

V-glide. General description, Nov. 30, 375. General comment, Nov. 29, 364, 365. Sketches, Nov. 28, 357;



(2)

skua chilensis Cont'd.

Nov. 29, 364 With a single LCN; Dec. 1, 382 With L.C.  
Nov. 26, 353; Nov. 28, 358; Nov. 29, 370; Dec. 4, 381  
Three birds giving L.C. from V-glide together; Nov.  
30, 375.

Aerial Pursuits. Simple; Nov. 26, 342; Nov. 27, 354;  
Nov. 30, 373, 374. Involving more than two birds;  
Nov. 29, 368; Nov. 30, 374; Dec. 1, 380. With LCN's  
or L.C.; Dec. 1, 380. With L.C. and V-glide; Nov.  
28, 358.

Simple Glide Description; Nov. 29, 365. General comment; Nov.  
29, 368

Swoop - Soar Performances. General comment; Nov. 29, 365;  
Nov. 30, 375. SS directed at potential predators; Nov.  
27, 354; Nov. 29, 364. SS during pursuit flights; Nov.  
27, 354; Nov. 29, 364. LCN's during swoops at other  
birds; Nov. 30, 376. LCN's at nadir of swoops at potent-  
ial predators; Nov. 29, 364. Swoops with notes interm-  
ediate between LCN's and Al C. Notes; Nov. 29, 370.  
Soar at end of pursuit flights; Nov. 29, 374.

Rattling Scream, (PCC?). During swoop; Nov. 27, 354.

Rusty squeals in air. By a bird dodging swoop; Nov. 30,  
376. During swoop; Nov. 30, 376.

Galloping. During pursuit flights, (during swoop?);  
Nov. 29, 364. During aerial fight; Nov. 30, 373.

General Comment Threat Postures. On ground; Dec. 1, 381.



(3)

*skua chilensis*. Cont'd.

Best Examples High-Intensity Disputing, Nov. 29, 369;  
Nov. 30, 373.

Probably Extraneous Preening Nov. 26, 352; Nov. 29, 367

Lateral Head-shakes In purely hostile situations, Nov. 26,  
346; Nov. 29, 370. In partly sexual situations, Nov.  
29, 367.

Post General comment, Nov. 30, 371. Sketches, Nov. 26,  
352; ~~XXXV~~. In purely hostile situations, Nov. 26,  
344, 352; Nov. 29, 360, 370; Nov. 30, 371. In partly  
sexual situations, Nov. 29, 363, 367; Nov. 30, 372.

PAG. In purely hostile situations, Nov. 29, 370; Dec. 1, 379.  
In partly sexual situations, Nov. 29, 367, 368.

Grass-pulling Description, Nov. 29, 369. Comments, Nov. 29,  
370; Dec. 1, 379.

Uprights Description, Nov. 26, 343, 347, 350; Nov. 28,  
355; Nov. 29, 360, 365, 370. Sketches, Nov. 26,  
343; ~~XXXV~~ Sketch of V during FB, Nov. 30, 372.  
General comment, Nov. 28, 355, 357; Nov. 29, 360,  
366, 370; Dec. 1, 380, 381. Intimidating effects of  
Uprights, Nov. 28, 355.

Unritualized "HF" Nov. 26, 347; Nov. 29, 368

LCN's on Ground. General description, Nov. 26, 344; Nov.  
29, 361. Relative rarity, Nov. 30, 376. Toward fly-  
ing lunds, Nov. 30, 373. Associated with regurgit-  
ation, Dec. 1, 377.



*skua chilensis*. Cont'd.Long Call Complex on Ground. General description;

Nov. 26, 343, 344, 347, 348, 349, 350, 351, 352,

Nov. 28, 357; Nov. 29, 359, 360, 362, 368, 369;

Nov. 30, 371. As display toward flying birds;

Nov. 26, 344, 349; Nov. 29, 359. General discussion whole complex; Nov. 26, 351, Nov. 28, 357,

Dec. 1, 380. Contagiousness; Dec. 1, 380. Intimidating effect; Nov. 29, 368.

Description O; Nov. 29, 362. Sketches O; Nov. 26, 344, ~~XXXVI~~. General discussion O;

Nov. 26, 351; Nov. 29, 359; Nov. 30, 371. Peculiar O; Nov. 29, 359. Particularly aggressive O's without wing-raising; Nov. 29, 362, 365.

The L.C. HD or L pattern. Sketches L; Nov. 26, 344; Nov. 29, 367, ~~XXXVI~~. General discussion L; Nov. 29, 359, 360, 367. Sketches L.C. HD; Nov. 26, 348, 351. Nov. 29, 363, ~~XXXVI~~. General discussion L.C. HD; Nov. 26, 351, Nov. 29, 360, 369.

Transitional notes to SHD; Nov. 29, 369.

SHD. Description; Nov. 26, 349, 350, 351; Nov. 29, 369; Nov. 30, 376. Sketches; Nov. 26, 351, Nov. 30, 372, ~~XXXV~~. General comment; Nov. 29, 369; Nov. 30, 376.Gaping. Description; Nov. 28, 355, 356; Nov. 29, 360. General comment; Nov. 28, 356, 357; Nov. 29, 369; Dec. 1, 380.Keeze. Description; Nov. 29, 370. Comment; Nov. 30, 372.



*skua chilensis*. Cont'd.

Squat. With Freege, Nov. 29, 370. Comment, Nov. 30, 372.

Possible signs of Pair-formation. Dec. 1, 381.

M.C. Description, Nov. 26, 346, 347, 348, 349, 352, Nov. 29, 360, Nov. 30, 371, 372, Dec. 1, 381. General comment, Nov. 29, 368, Nov. 30, 372, Dec. 1, 381. Circular parading, Nov. 26, 349, 352. Possible extra-cous preening during M.C.'s, Nov. 26, 352.

Actual Fighting between Seves. Direct. Description, Nov. 26, 352, Nov. 29, 362, 363, 366, 368, Nov. 30, 372, 373. General comment, Nov. 30, 372, 373. Reducted, provoked by outside source(s) and vented on mate, Nov. 26, 353, Nov. 29, 369.

FB, Regurgitation and Associated Patterns.

Description FB, Nov. 26, 342, 347, 348, 349, Nov. 29, 361, 366, 367, Nov. 30, 372, Dec. 1, 377.

Sketches, Nov. 26, 343. Movements reminiscent of T., Nov. 26, 347, comments, Nov. 29, 363, Dec. 1, 377.

Description "FBM" posture, Nov. 29, 361.

Sketches "FBM" posture, Nov. 26, 348, Nov. 30, 372.

Description "MH" posture, Nov. 28, 358.

Sketch "MH" posture, Nov. 26, 347. Possible M Notes. Thin, reedy LCN's, juvenile-gull-type, Nov. 26, 347, Nov. 29, 370. Rusty notes, Nov. 29, 362.

Apparent mutual FB (and possibly traces of mutual regurgitation), Nov. 29, 358, 361.

Definite regurgitation, Nov. 29, 366, 367, 368, Dec. 1, 377.



*skua chilensis*. Cont'd.

Copulation ♀ soliciting posture, like "MH", with tail above wings, sketches, Nov. 26, 350, Nov. 29, 361. Description of copulation itself, Nov. 26, 345, 349, Nov. 29, 361, 363, 366, Dec. 1, 377. Sketches male copulation posture, Nov. 26, 346, ~~XXXV~~. Cop. Call, description, Nov. 26, 345, Nov. 29, 366, 367, Dec. 1, 377.

Post-Cop. Reactions. Description, Nov. 26, 346, 350, Nov. 29, 361, 363, 366, Nov. 30, 374. General comment, Nov. 29, 361, Nov. 30, 374.

Possible Nest-Site Selection. "MH" posture as a preliminary, Nov. 29, 362, 367, Nov. 30, 374, Dec. 1, 378. FB and Regurgitation as preliminaries, Nov. 29, 367. Sketches "sitting in nest" posture, Nov. 30, 374.

Onset of Incubation Phase. Description, Nov. 30, 374.

*lunata*. January, 1957, Easter Island

Aerial LCN; loud shrill aerial notes (obviously homologous with the "Teeeee-ern" Notes); an aerial Rattle, and Gouts and Uprights on the ground; Jan. 20, 421, 422.



scored.

November - December, 1956.

General Description Environment. Colony & communal areas.  
Nov. 8, 330; Dec. 4, 383.

General Comment Hostility. Nov. 8, 332, 334. Rarity of displays in immediate association with overt attack; Nov. 9, 337. General comments about counts; Nov. 8, 336.

Attack Behavior. Comments; Nov. 8, 334.

Alarms of Distinct Alarm Call. Comments; Nov. 8, 333; Nov. 9, 339.

Permit Flight. Chasing Kelp gull, with PCC (?) notes; Nov. 22, 340.

Swoop - Loar. Description; Nov. 9, 338. With M (?) Notes; Nov. 9, 339.

Aerial Long Call Performance. Complete performance; Nov. 22, 341. Sketch HD posture; Nov. 22, 341; ~~XXXVII~~. Sketch (OL) posture; Nov. 22, 341. (OL) Notes alone; Nov. 22, 341.

Calls Accompanying Landing. General rarity; Nov. 8, 334. LCN's; Nov. 8, 336. M Notes; Nov. 9, 339. Peculiar abbreviated L.C., description and sketch of landing HD Posture; Nov. 9, 339.

Long Call Notes. General comment; Nov. 8, 333, 334; Nov. 9, 339; Nov. 22, 341; Dec. 4, 383. As aerial pattern; Nov. 8, 337. As landing call; Nov. 8, 336; Nov. 9,



(8)

scorelii. Cont'd

337. Before flying up; Nov. 8, 336. Ordinary LCN posture on ground; Nov. 8, 336. Intermediates between LCN and T and M Notes on ground; Nov. 8, 336. "Alarm LCN's"; Nov. 8, 334; Dec. 4, 383

Long Call Performance on Ground: General description; Nov. 8, 331, 333, 336. General comment; Nov. 9, 338. Variations; Nov. 8, 332, 333. Diagram whole call; Nov. 8, 332

O. Description; Nov. 8, 331, 335, 336; Nov. 9, 337. Sketches; Nov. 8, 331, 335, 336; Nov. 9, 338; XXXVII

HD. Description; Nov. 8, 331

(OL). Description & sketch; Nov. 8, 331

T. Description; Nov. 8, 332

Independent Wattle Tearing. Description; Nov. 8, 335. Sketch; XXXVII. General comment; Nov. 8, 332; Nov. 9, 337. Obvious intimidating; Nov. 8, 333

Shull LCN's. Description; Dec. 4, 383

New Call and Postures. Description, notes & postures; Nov. 8, 333, 334. Sketch posture; Nov. 8, 334, 334. Notes from U; Nov. 8, 334. Notes as landing call; Nov. 9, 339. General comment about notes; Nov. 9, 339.

Apparent Abreuve Ch. and Glik. Dec. 4, 383.

Uprights. Description; Nov. 8, 332.

HF. Nov. 8, 330, 334; Nov. 9, 339.



scorebii. Cont'd.

PAG. Possibly high-intensity; Dec. 4, 383.

Actual Fighting between sexes. Attacks ♀; Nov. 8, 335.

M.C. Description; Nov. 8, 335; Nov. 9, 337, 339.

FB. Description; Nov. 8, 330; Nov. 9, 338. Difference between partly-serial and purely hostile T; Nov. 8, 335.

Regurgitation Description, apparently quite silent; Nov. 8, 330, 336; Nov. 9, 338. Accompanied by resolution attacks by male; Nov. 9, 338.

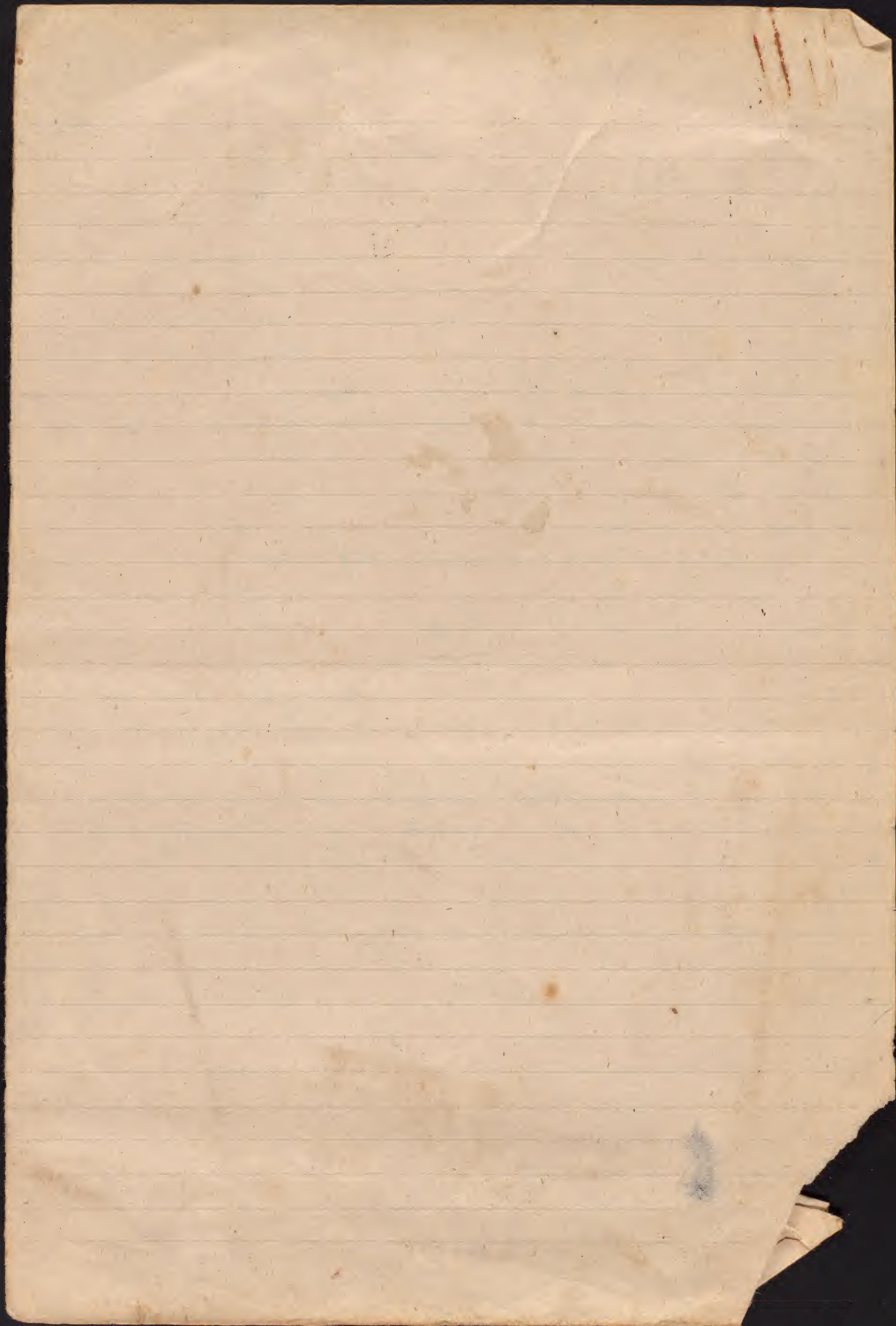
Mutual Begging. Description; Nov. 8, 330, 331, 335; Nov. 9, 338.

Gouts. Associated with mutual T-ing; Nov. 8, 335.

Copulation Description; Nov. 8, 335. Cop. Call, description; Nov. 8, 331, 334, 338. Attempted rape; Nov. 8, 331.

Post-Cop. Displays Nov. 8, 334, 335.







atricula

①

September 25,  
1955

Balboa + Panama City

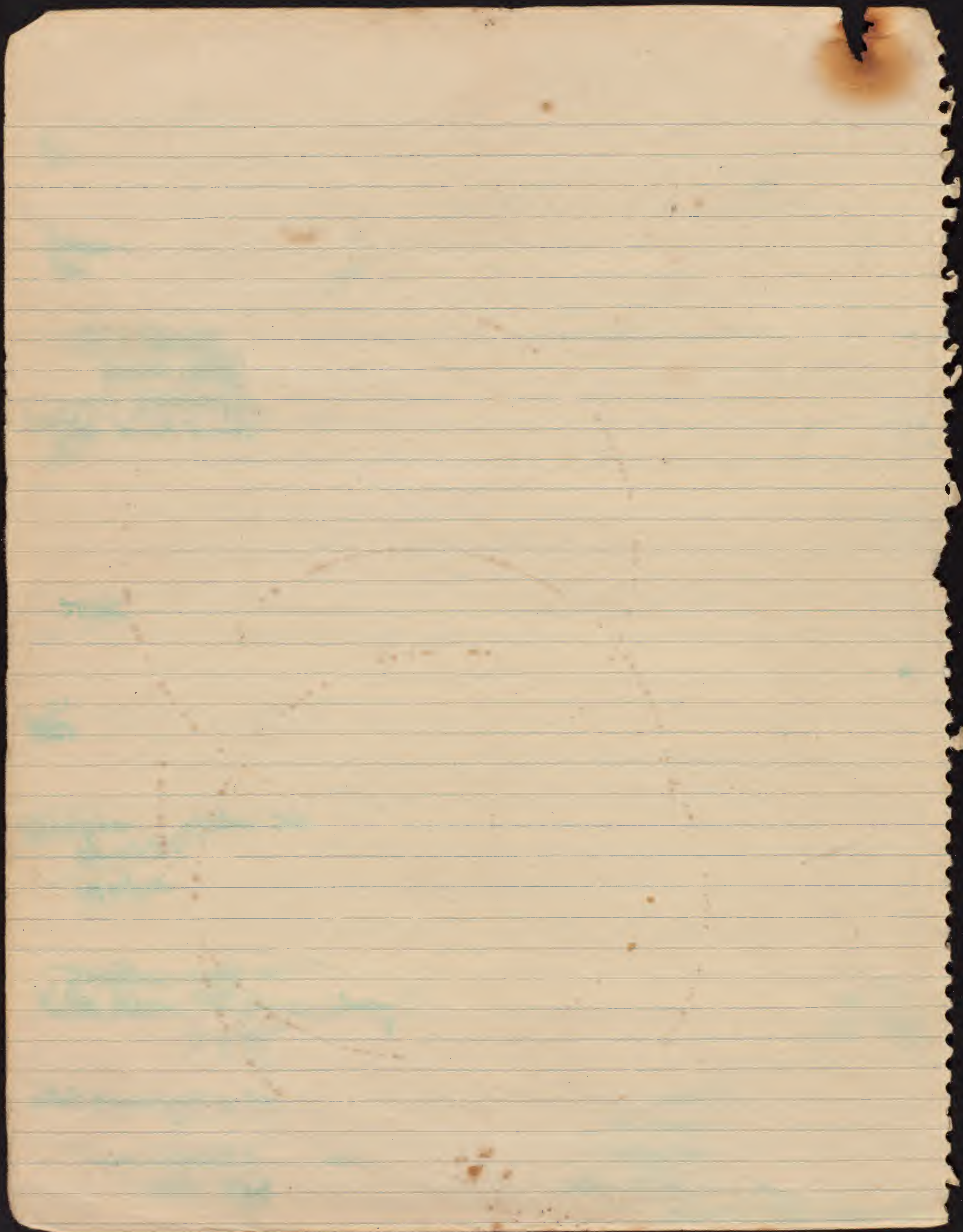
Along waterfront, near sewer outlets. Large flocks of Laughing Gulls. Adults + immatures, apparently pre-molt, very ragged. Lots of juveniles.

Juvenile behavior. Pursuit flights, after food, apparently quite unritualized. Joined in general water flights with adults and immatures, also apparently quite unritualized.

Only uttered LCN's. Unab juvenile red effect. "Kee-e-e-a-a-a" sort of hummer.

Adult behavior quite undistinguished. Only thing of note was alarm call. Typical hooded gull type. Monosyllabic or bisyllabic.







September 27  
1955

New species. N. of Puma Island. Felp Gulls  
Opposite Puma. Large flock (approx 20) Saline's Gulls. Possibly  
Noddies (but more probably juv. Noddies).

Month of Guayas River. One Mountain Gull (?)  
(possibly Gray-hooded), aerial fight with Man o War bird.  
No ritualized movements, but this gull gave repeated long  
LCN's, very reminiscent of Bonaparte's. (This bird had very  
little trace of hood)  
Probably Gray-hooded !!!

cinchocephalus

September 28th,  
1955

Gray-hooded Gulls all over Guayas river. Opposite  
Guayaquil and perched on beams of ship. Showing very little  
ritualized social behavior.

Several LCN's, and a fragment of LC, during dispute  
over perch. Voice definitely like Bonaparte's, sort of shrill  
rapping buzzy shriek. Stronger than Bonaparte's, perhaps  
lacks the Rarjo-like quality.

Have very postures that look like very low-intensity,  
or unritualized, Obliques and Forwards. Far too weak and  
brief to be of any use. Accompanying fragment of LC

Notice that the general effect of the bird is very much like  
B h G. General shape & posture.  
Hood appears to be "cut-off", in back, at least as much as  
Bonaparte's. Some of these hoods appear to be complete. Blackish  
on all around.



cirrhocephalus, Sept. 28, 1955, II.

Bill & legs & feet appn. same color as those of B. h. g.  
Inside of mouth, in the one case I witnessed, appeared to  
be less red than that of B. h. g.

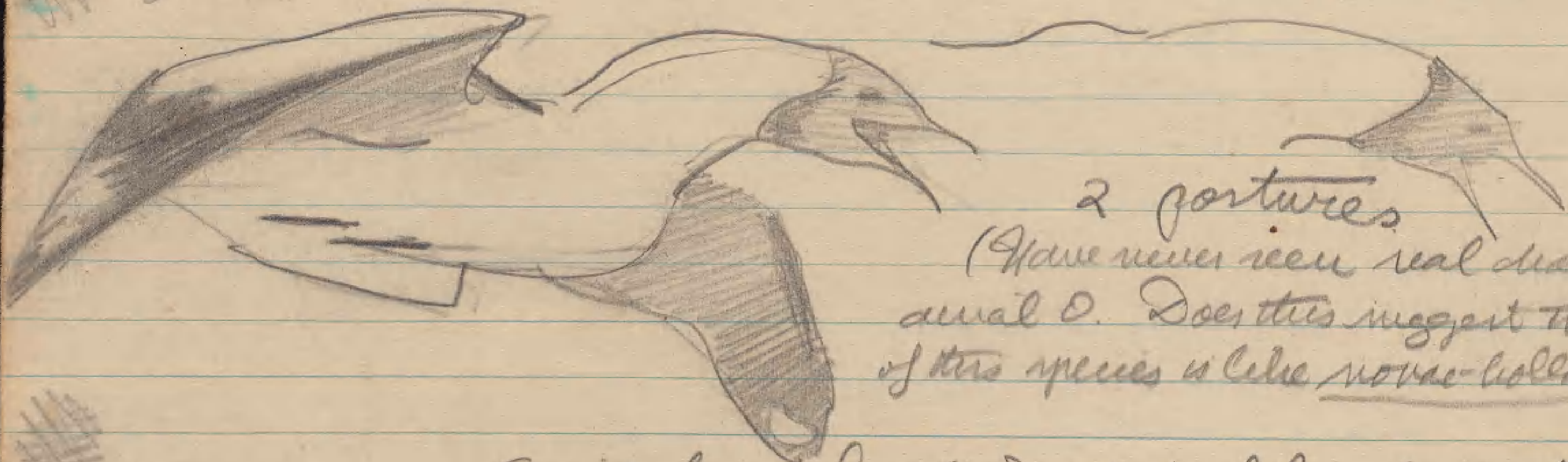
Its light, giving most curious effect.  
Couldn't tell whether white eye shows or not. Certainly  
not conspicuous.

Wing pattern not as different from B. h. g. as might be  
expected. Definite quite dark underneath, getting darker on  
primaries. Only warblers (?) show white from beneath.

cirrhocephalus

October 3, 1955

One Grey-hooded, after flying up, repeated, long, LCN's  
"Keeaaaar Keeaaaar Keeaaaar . . . ." Very  
long, but somewhat more B. h. g. - like than the other LCN's  
I have heard.



2 postures  
(Have never seen real diagonal  
aerial O. Does this suggest that O  
of this species is like novae-hollandiae?)

Aerial chase & fight. Just brief, harsh, LCN sounds.

Almost all these birds are landing without any trace of  
a landing call.

Have just heard long aerial LCN's again.  
Remarkably long, and vibrate at the end.  
"Keeeeeaaaaaar"

Just after flying up in group

come ca  
5



October 2nd,  
1955

Visit to Playas. 2 new species.  
Thalassus etc. Either maximus or elegans. In white  
plumage.

Pennine Gray Gull. Remarkably like photos of Heermann  
in appearance.

Neither shot anything

October 4th,  
1955

A hooded gull of another species showed up. Either  
Laughing or Franklin's. Only seen very briefly. Definitely smaller  
than the Grey-hooded gulls it was with. Black primaries, but  
no other obvious signs of immaturity, (could not notice any tail  
band). Rather problematical, but presumably Franklin's.

certhocephalus

October 6th,  
1955

Might as well set down what I know about  
threat postures of the Grey-hooded Gull — which is damn  
little. All observed during disputes over parking places  
on masts & bows of ships anchored in Playas River. All  
observed at Long Dunes. All presumably accompanied by  
LCN's or some sort of L.C. (although I couldn't hear a thing)

Many postures, apparently unritualized.  
Directed straight toward opponent. Comme ça:

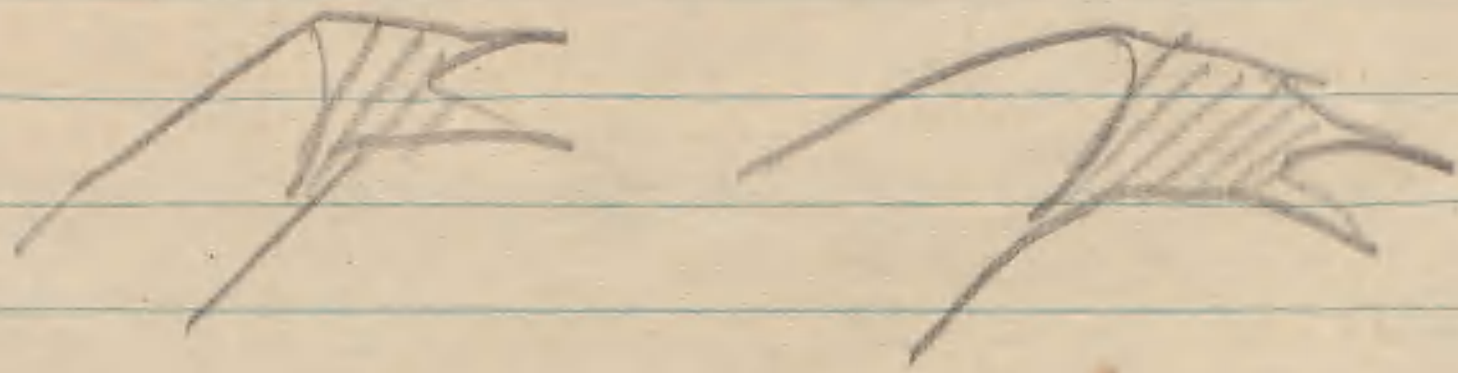




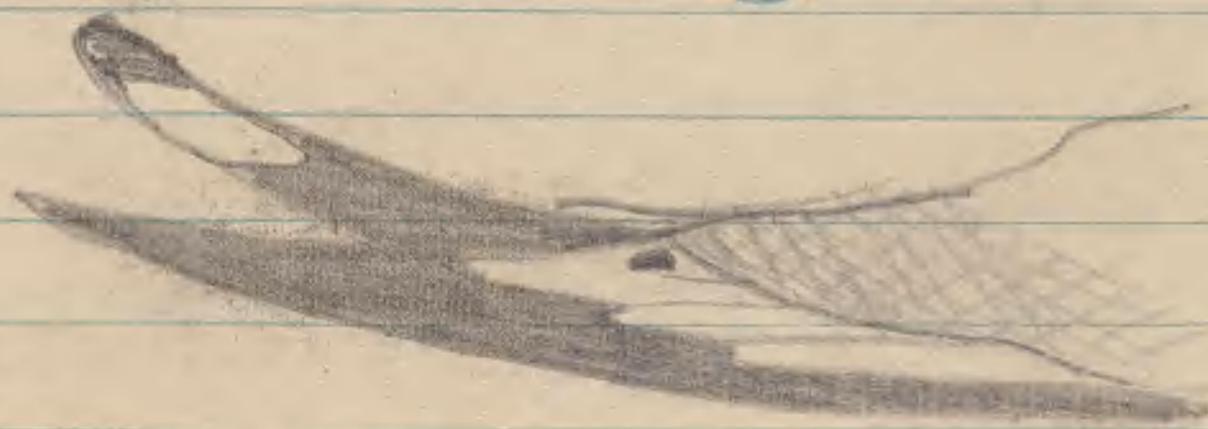
cinereocephalus, Oct 2, 1955, II

(5)

Some which look like O of Hartlaub's or low-intensity  
O of B h g



Some which look like low-intensity, short-necked, F's  
(Usually accompanied by some raring of scapulars, but probably  
smooth raring, probably not a real R)



White & black  
pattern of winged wings

Before I forget - something I noticed my first day  
here. During disputes over perches, when the dispute becomes  
particularly intense, the LCN's become particularly short &  
harsh. Almost like Gk. Reminiscent of Bonaparte's in  
similar circumstances.

These gulls appear to be moulting? Does this mean  
breeding season is just over? ! ? ! Definitely moulting.  
But no juvs. present

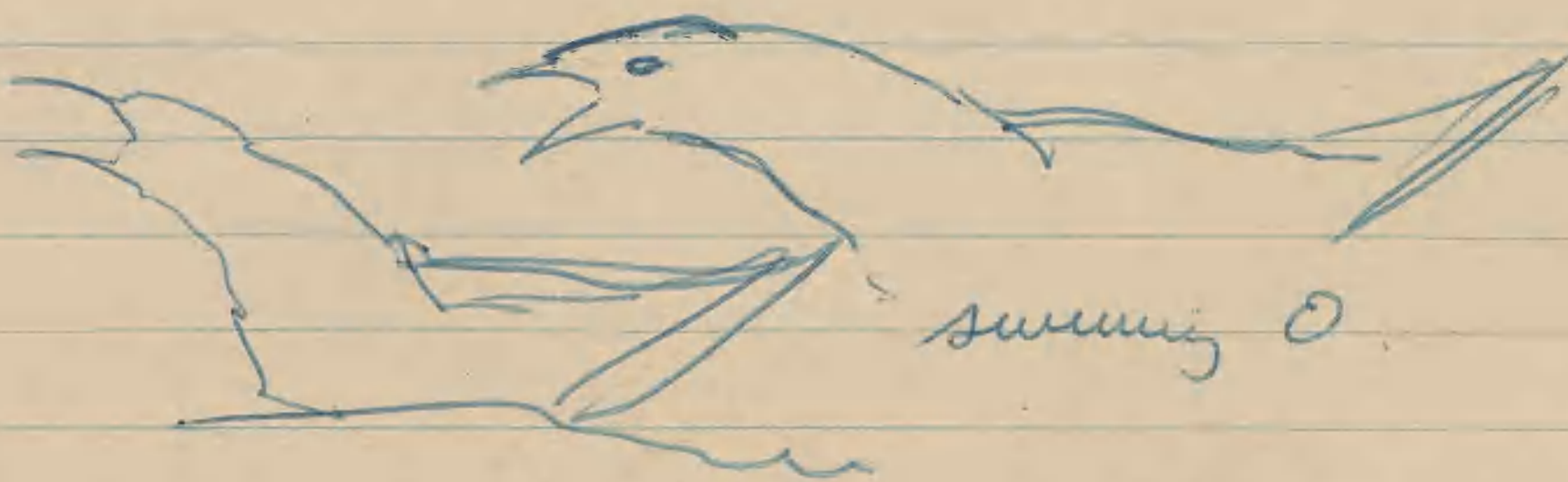
October 13, 1955

Have seen, again & again, but at a great distance  
postures which are almost certainly F's. Just like B h g.

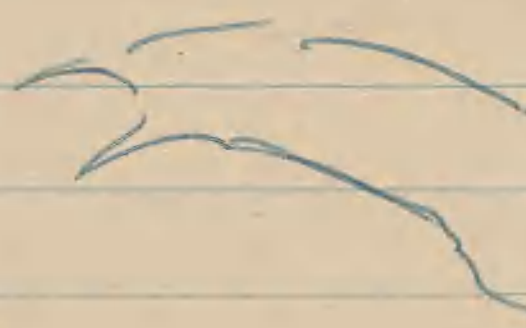


October 9, 1955

La Libertad, Ecuador 11:30 a.m.

Both juv. & adult modestus around pelicans. Mostly trying to steal food.Juv.

accompanied by  
typical "needy"  
"Kee-aa" LCN's!



flying O.

Rather plaintive, whining sound to this call!

Some of the LCN's of juvs. are more like "Kheoo", but  
still needy.

Definite, marked, HT by young bird toward adult

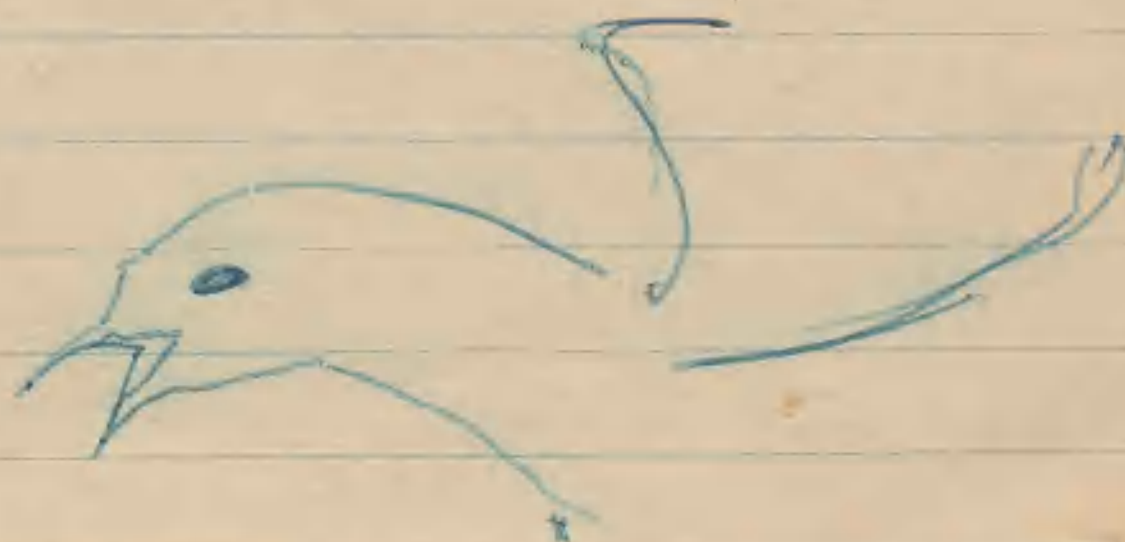


extreme HT.

HT movement by 1 of 2 adults attending pelicans!

One adult does brief, slight HT movement toward another,  
as the latter lands nearby.

Adult Landing Call posture





modestus, Oct. 9, 1955, II

7

Again, an example of adult (apparently, definitely non-nuptial plumage) HT toward adult in nuptial plumage. No sign of real FB.

HT note of both adult & juv is soft "Xiao" sound, i.e. typically larval.

As far as I can tell the LCN's of the adults are much the same as those of the juv's, but I may be mistaken.

Common adult pattern:

Looks almost like Gape, short-necked, but probably accompanied by an LCN.



Adult down into humbled, then HT before attack on juv.

Adult repeatedly HT toward all sorts of birds. From H, with R. Even HT to a Pelican flying over head. Then V before attack. V after attack & HF - V before attack - V-HF - Cpr or Pr after attack.

Apparent pairing behavior, which I didn't catch well. One bird elaborate LC performance, then V-HF-V-HF etc. Second bird walks around first in H, then flies off!!!

Adult LCN is apparently "Xian" Quite short. But definitely "reedy". Almost broken up into 3 or 4 short syllables.



LCN Posture



modestus, Oct. 9, 1955, III

(8)



LCN posture on land, rather  
more forward inclination

Now about adult LCN. Sometimes very cat-like  
"Kiaaw" or "Kiaow", without or with noticeable rattle.  
Have also noted all sorts of intermediates between "typical" adult  
LCN's and "typical" immature LCN's. Must stress, again, that  
some of the immature LCN's are just like those of many northern  
gulls.

About this elaborate Long Call performance I got a  
brief glimpse of — two phases of posturing, I think, one high &  
one low, (C → L?). Accompanied, first by series of very  
rapid (cackling?) notes, then at least one, probably several,  
longer trumpet-like notes.

Typical alarm posture after seen.

Alarm Call "Ha ha ha" Usually 3 syllables —  
this somewhat resembling all of Hydrocoloeus gulls. Much  
more similar, in sound, however, to the all of the "typical"  
Larus gulls.



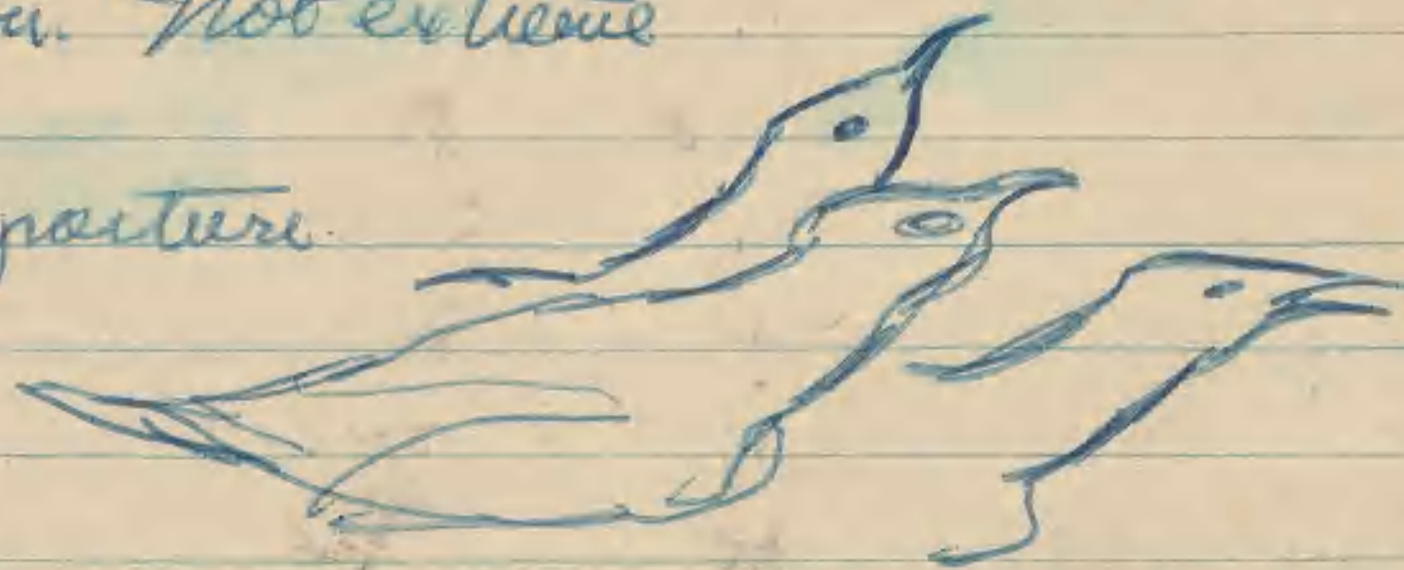
October 11, 1955

La Libertad Communal area

Lebent pavis quite common. Not extreme

Mutualized pre-attack posture

Quite like other gulls



Also gape before attack

Apparently quite mutualized brief. Inside mouth, feet clung as far as I can see

Posture during running retreat

Definite upward inclination of bill, neck stretched upward

only semi-



Juveniles do during many of these mutualized pre-attack movements (actually a movement rather than a posture), sometimes leading to a more or less oblique pecking movement. Adults in nuptial plumage occasionally doing same thing

Adults, apparently toward flying bird, very high O, getting a little shorter & lower as it ends, no real L or anything. Accompanied by loud LC notes which I couldn't hear very well

Rough drawing



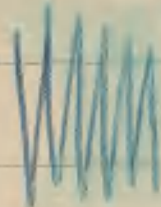
Head & neck at highest



modestus, Oct. 11, 1955, II

(10)

Again seen O, again very high, again alone, without post-



lude

Very long-billed species

at peak

at end

carpal joint out

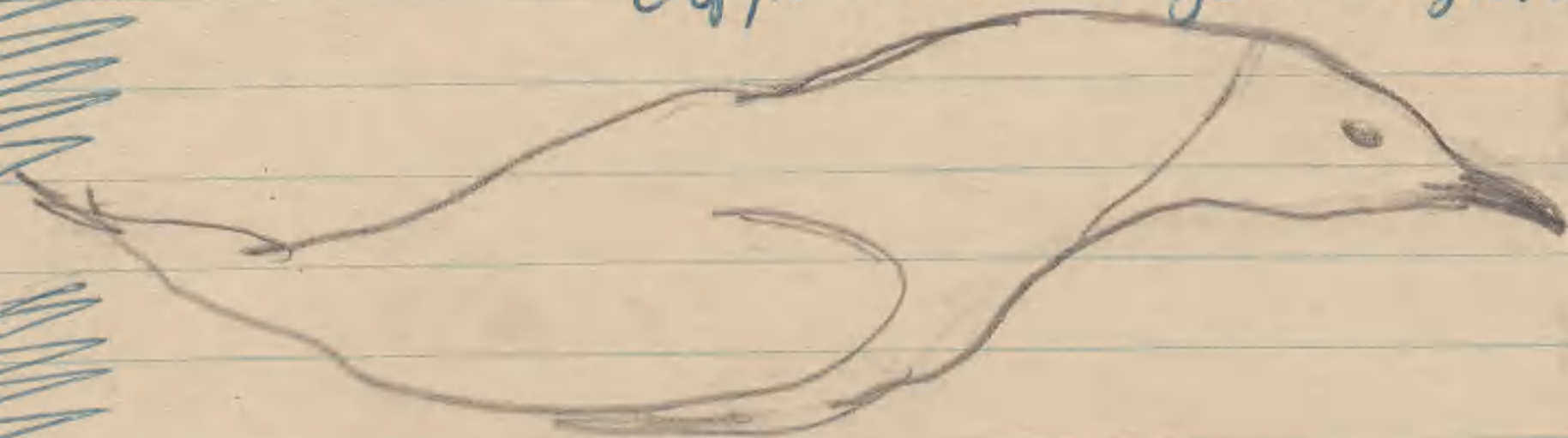
Body sometimes  
much more oblique, more  
nearly vertical.

MC. !! One bird O  $\rightarrow$  L. L just about typical,  
but perhaps somewhat short-necked. Not as low as some L's of  
Franklin's Gull. Other bird just V. Then both birds V-HF =  
V-HF etc. (Carpal joints out, but not too much and not  
conspicuous). Feathers of nape looked ruffled, but probably due  
to the wind.

L.C. with this O  $\rightarrow$  L. Couldn't hear, but it was very  
noticeable that the bill was rapidly opened & closed, very rapidly,  
during O.

Seen again, as before.

Approximate angle & length during L.





modestus, Oct. 11, 1955, III

(11)

HT from H, by adult non-nuptial, after being attacked (attacked by adult nuptial). This may have been mate of attacker, but I don't think so. Certainly not followed by FB or any sign of pairing.

Adult begins O & L.C. (rapid bill movement) as another adult passes by on foot. Then does HF, twice, while continuing O, when passing adult turns & approaches. Then, without any sign of L, goes into V, HF, Cpr. (This HF was very obvious, an evasive movement, and the Cpr certainly seemed to develop from HF).

Bill movements rapid throughout O. This must be the "cackling" part of call.

Monday,  
October 17, 1955

Finally left for Galapagos today.  
Just adding a few notes about the birds in Ecuador when I left.

Great contrast between the birds on the river, at Guayaquil, and those along the coast (Playas, Salinas, and particularly La Libertad).

Along the River: carrocephalus, glaucibellus, an occasional juv. modestus, and one northern gull (either atrifrons or pipixcan, black primaries but smaller).

Along the Coast: modestus, Thalasseus (either elegans or maximus), a few Sterna (probably hirundo), a few Leucocryptus (not noticed near shore or very recently).



Thursday,  
October 20, 1955

Saw first *furcatus*, about 240 nautical miles from San Cristobal, or about half way between the puntilla Santa Elena and San Cristobal.

Monday,  
October 24, 1955




First seen *furcatus*, on crumbling lava cliffs, at Ballena, (west coast of Floreana, i.e. Charles).

Breeding colony, one nest with one egg, several others without egg. All birds apparently paired.

Most of their hostile reactions were directed toward us.

1. Alarm Posture. Just like other gulls. With much side to side head-turning.

2. Gape. Toward us. Looked like "L.C.N." without sound. In semi-O posture.

3. Ticking. Ratchet-like noise. Quite un-bird-like. In semi-O posture, just like photograph in Murphy. but sometimes with wings held slightly out, or, at least, wrists visible. Sometimes just plain Ticking. mmm sometimes 2 phases mmm  or mmm  or mmm 

sort of thing. Very often whistling, followed instantaneously by a brief period when Ticking and Whistle simultaneous, followed very shortly by a longer period when there is only whistle alone.

The Ticking is very different from anything I have ever heard a gull give. The only thing it resembles at all is the vibration or rattle in the L.C.N.'s of adult *modestus*.

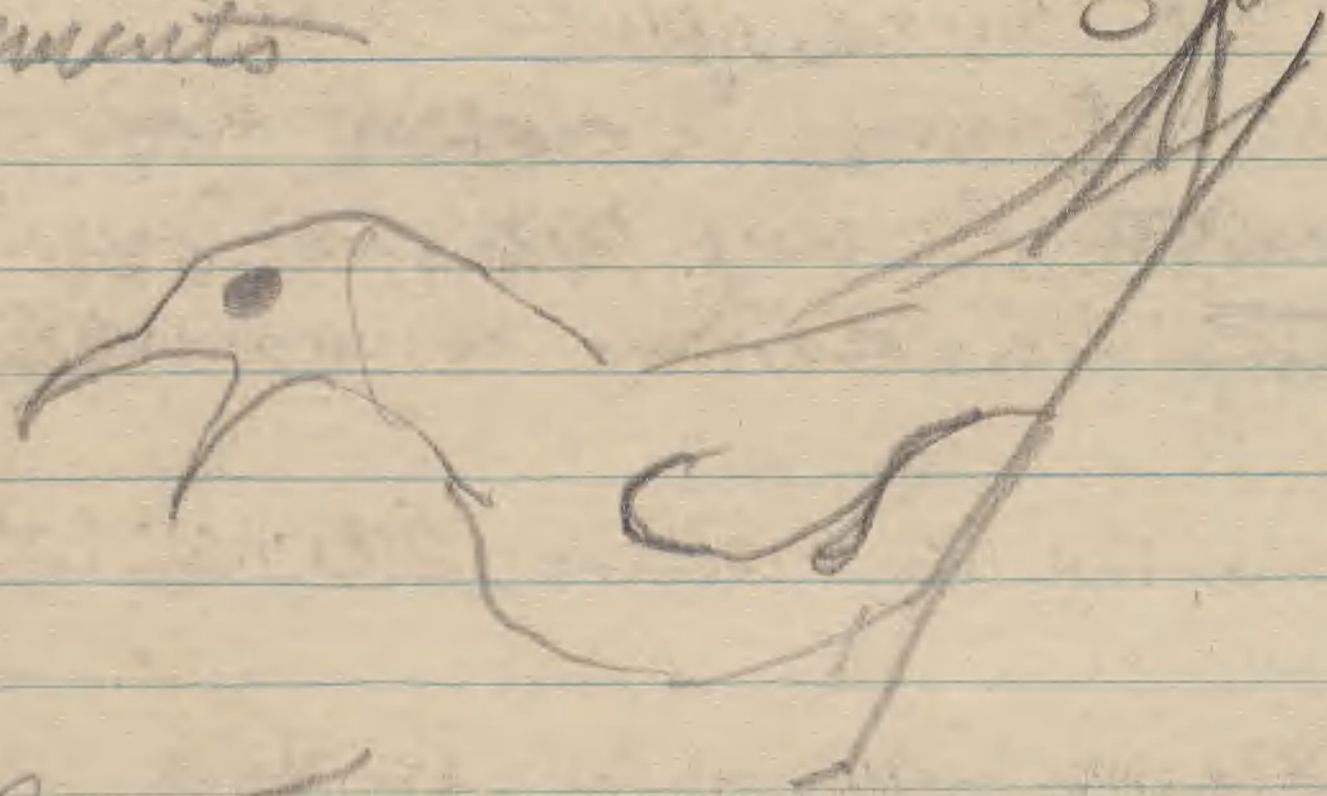


furcatus, Oct. 24, 1955, II,

(13)

I imagine that the Tiding is more or less homologous with the L.C.'s of other gulls, but it might just conceivably be more closely related to the A.C.

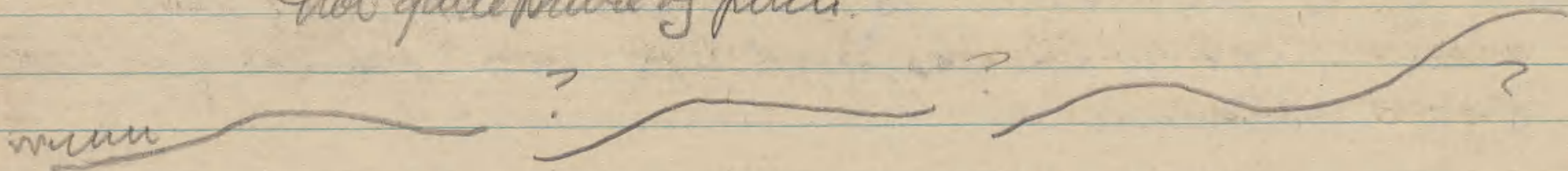
Once saw one bird give definite & prolonged Tiding in a posture very much like a Ring-bill or Herring Gull Ch. posture, but without any "pumping" up & down head movements.



Most Tiding directed toward us, but some apparent exceptions.  
4. Whistle. "Wheoooo" is about as good as I can transcribe it. Quite melodious.

Given from semi-O posture on ground. Sometimes by itself alone. Sometimes preceded by brief Tiding, or accompanied by Tiding during its first part.

(This species is most peculiar, insofar as it can utter two distinctly different sounds simultaneously.)  
Not quite sure of pitch.



Most whistles provoked by us. Some apparently provoked neighbor or mate, certainly directed toward neighbor or mate.

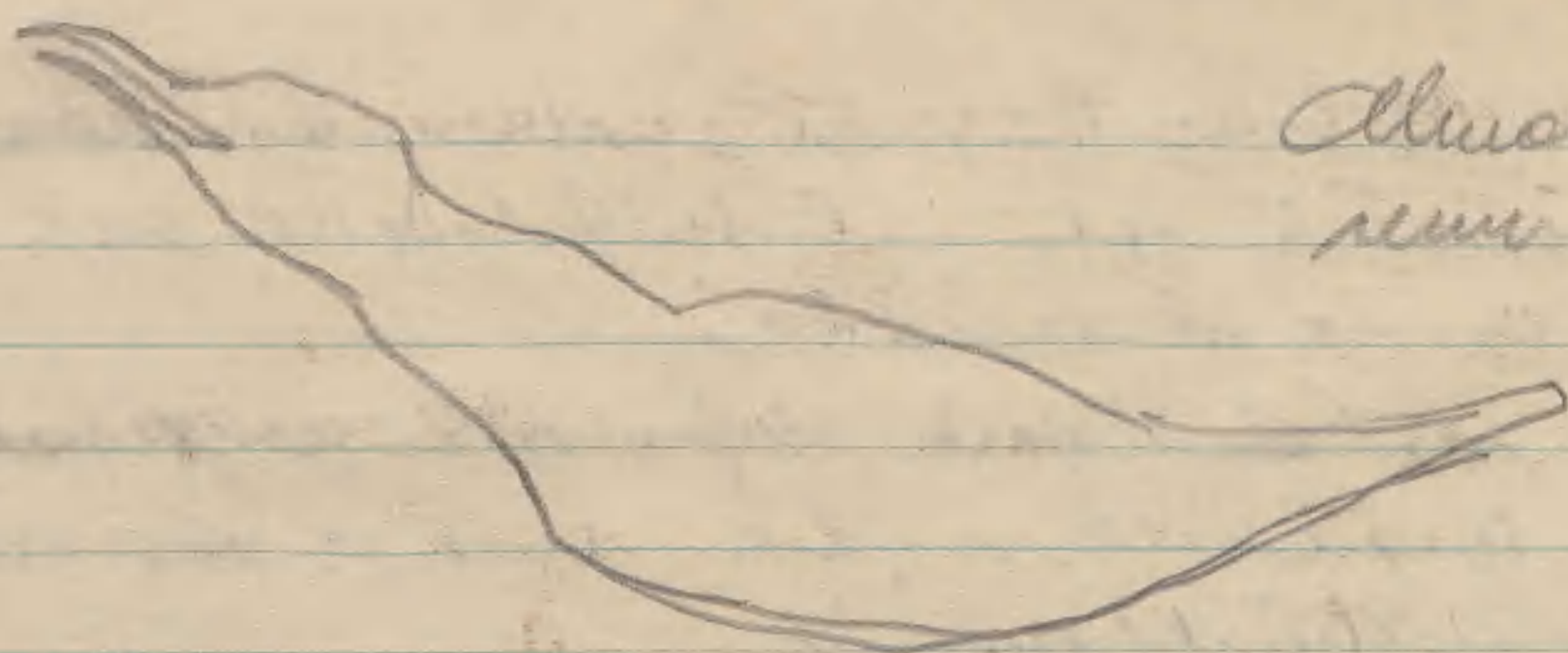
All the Whistles by birds on the ground were essentially monosyllabic. Quite peculiar. (Bill certainly usually remained wide open, in some way, no sign of closing during both Tiding & Whistles.)

Peculiar posture adopted by one bird, probably of toward other bird flying nearby. Repeated. Accompanied by soft version of whistle, probably no Tiding. A real diagonal posture.



Juncatus, Oct. 24, 1955, III

(14)



Almost  
semi-F

One thing about the usual semi-O accompanying typical whistles on the ground must be noted. The carps were probably held out further during this pattern than any other, but still nothing like as far as is usual in other hooded gulls.

No sign of an extreme O posture like so many other gulls.

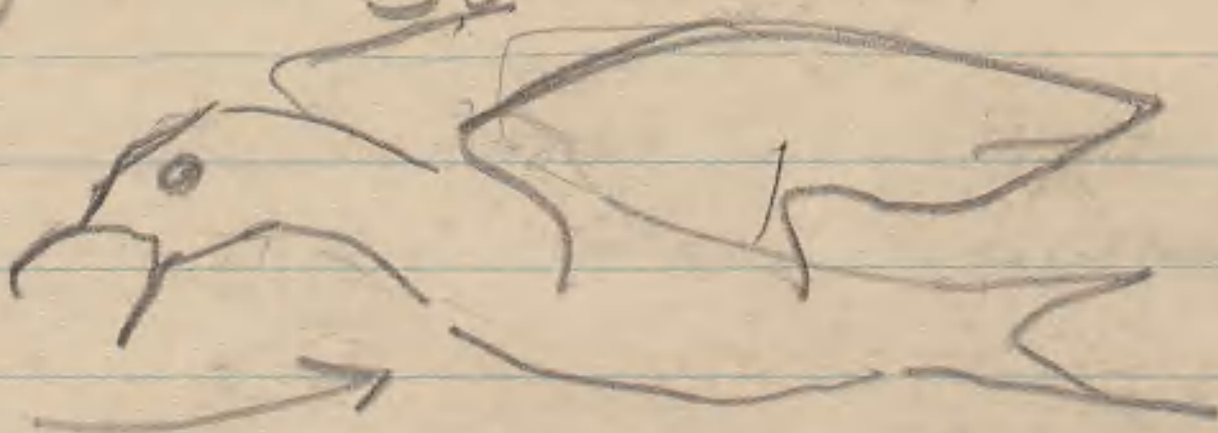
The semi-O often alternated or accompanied by side-to-side head-turning when the birds were much alarmed.

5. Other "alarm" or "nervous" reactions on ground. OCB And a very rapid side-to-side head-shaking about, while held in Alarm Posture, bill pointed diagonally upward.

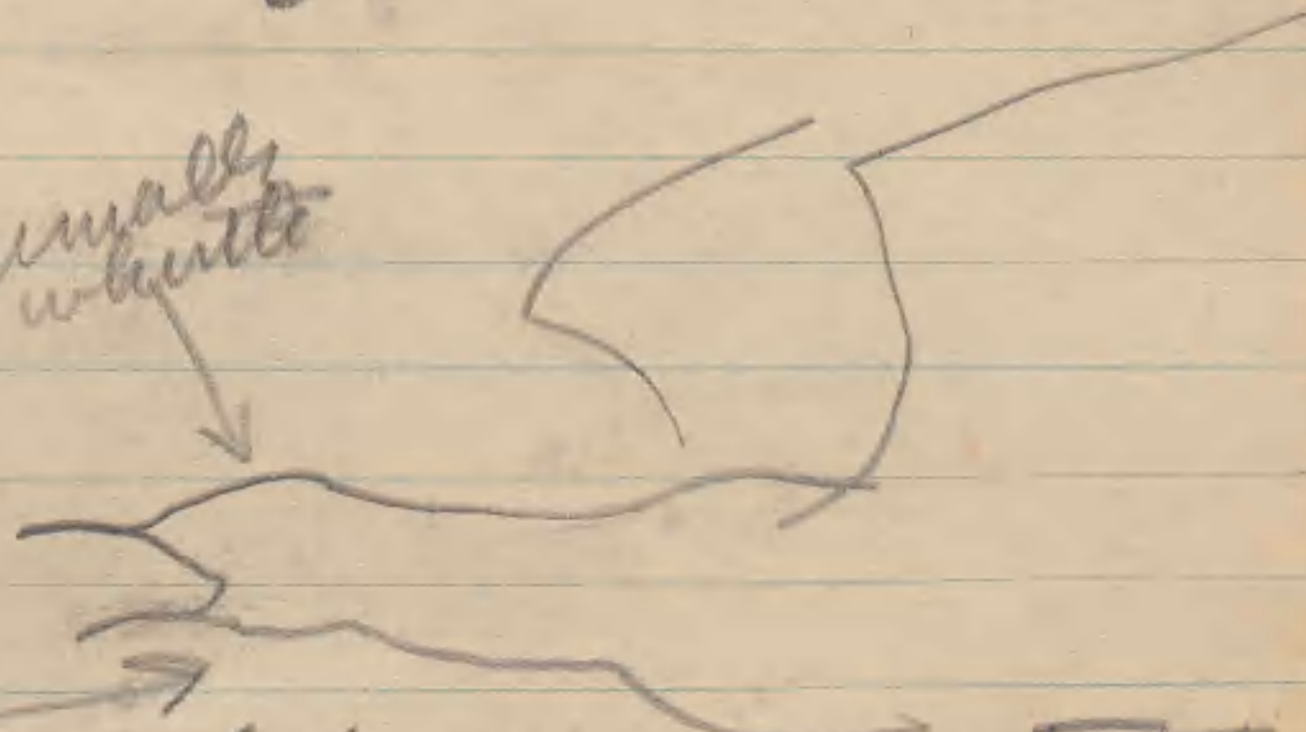
6. "Choking" One bird caught one brief glimpse. Much like Hairy gull in posture apparently. Pumping head movements, couldn't hear sound. Might have been muffled-fucking. Might have been silent, just rapid pecking at the ground.

7. Aerial reactions. Sisking & Whistles, separate or temporary combined, sounding just like same calls on ground. Also longer, more quavering, whistles. No very striking postures.

Both  
whistle  
&  
tucking



usually  
whistle



This was somewhat peculiar, a rather marked horizontal stretch



furcatus, Oct. 24, 1955, IV.

(15)

Some of the longest, most quavering whistles were absent, but certainly not polysyllabic.

No ritualized aerial movements.

When Capt. D went to the nest with an egg, the owners did swoops & roar, but most unspectacular and obviously unritualized.

It is significant, however, that these swoops were accompanied by whistles. Perhaps particularly loud long drawn, (quavering?) whistles. Shows that whistle must contain an actual, strong attack drive, even if it does also contain a strong escape drive (which may or may not be true).



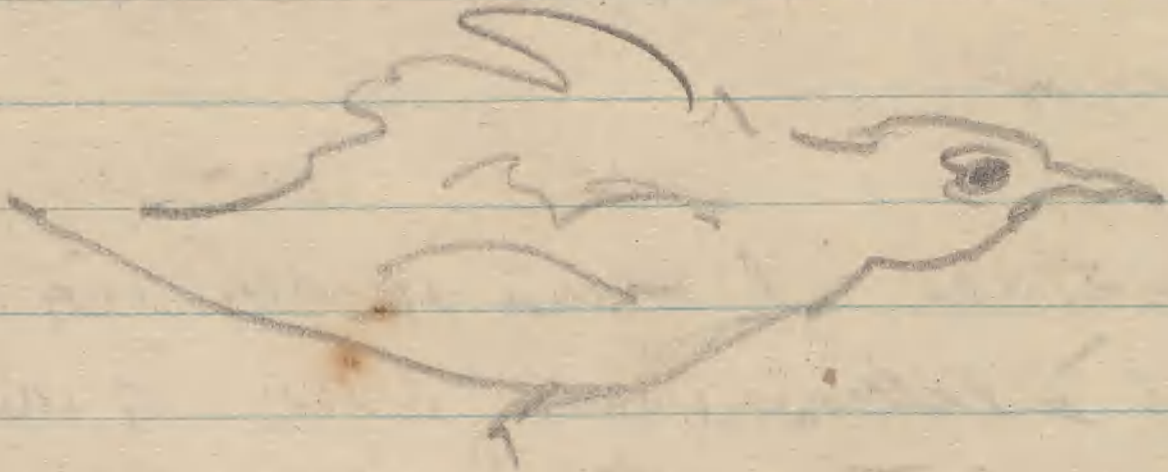
Juliginosus, I.

(16)

October 24, 1955  
Kilamul,  
Isabela

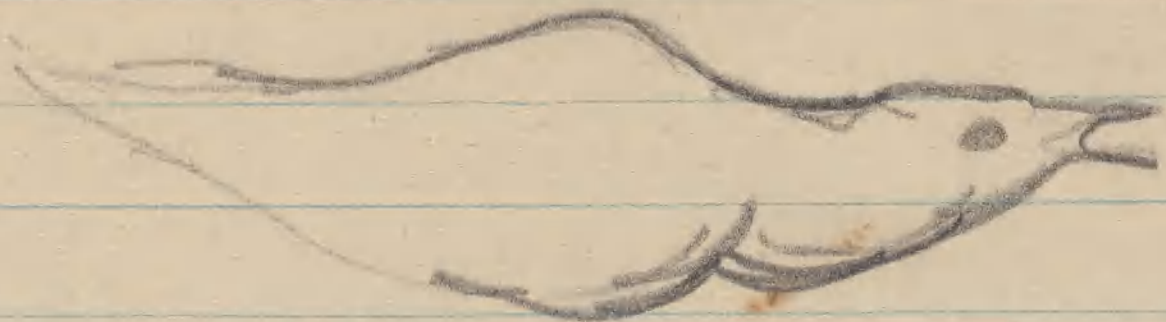
3:20 p.m.

Small dispute over food. One bird advances, in H or semi-H  
with R.



Then goes into L.C. First O (not too high), with unmistakable rattle or ticking, then, as  $O \rightarrow L$ , gives "Row-Row-Row-Row-Row-Row-Row-Row" notes.

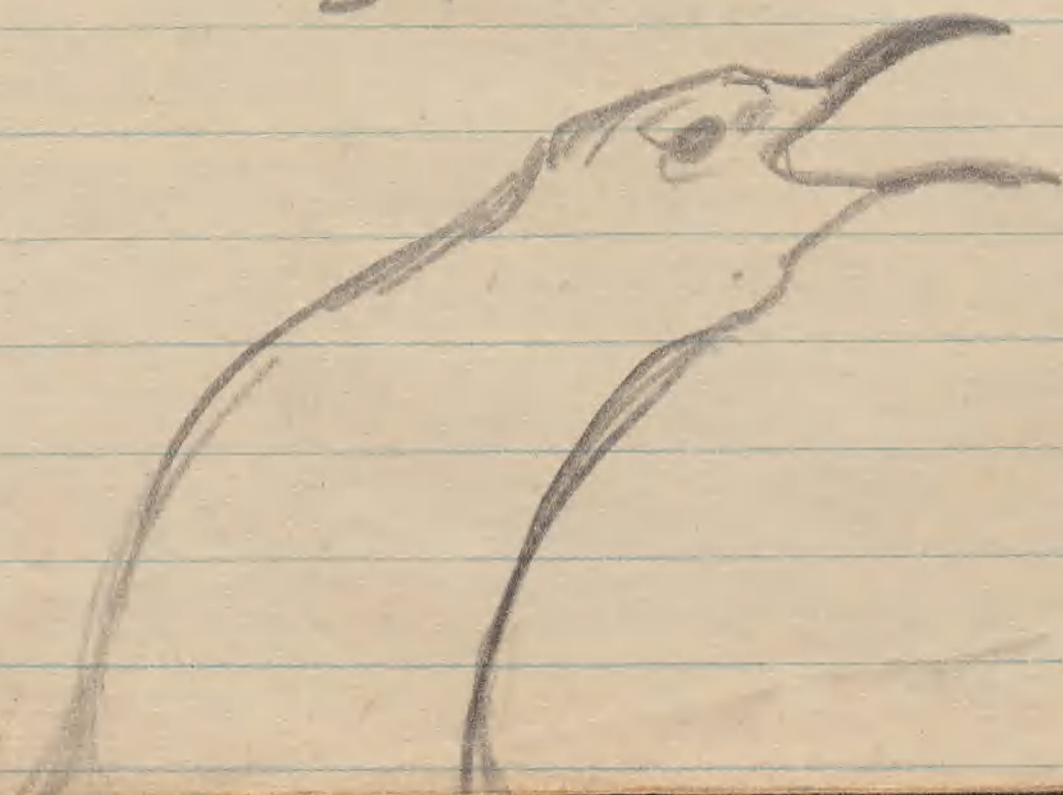
~~Row-Row-Row-Row-Row-Row-Row-Row~~ This L immediately becomes an almost horizontal stretch, and this immediately becomes something like an F. Neck an inverted arch, but head & bill almost horizontal.



"F"

I think that the last L.C. note was uttered in the F

Another dispute over food. Again provoking L.C. performance. Begins with Tucking or Battle (a slightly less "pecking" rolling of r's than the Tucking of furcatus). In O. High but perhaps less high than O of modestus. Neck very swollen. Bill remains permanently open.



Red inside mouth



This gradually changes into L as "Kow" sounds begin. Neck becomes very much thinner. The last bit of the L, and the real "laughing" L.C., is an "F". This followed by T, with quite ordinary "Kow" sound. Then bird stands in relaxed or semi-H posture, with slight trace of R, (scapulars lifted as a trait), silent, relaxes.

Might just as well record some observations I made earlier, from the ship. Two birds, possibly pair. Sometimes, when joining one another, both did O-L-"F"-T. Once saw L-O-L-"F"-T. Once saw O-L-"F"-T-T. Usually followed by semi or low intensity moderate V-type posture. Possibly HF. Sometimes when the birds joined one another they both just stood in semi-O and gave numerous, repeated, LCN's.

These L.C. postures are accompanied by very little, if any, raising of carpal joints (No white on front edge of wing). Carpal joints may be just visible.

The last dispute I saw, in which one bird did O-L-"F"-T, did not appear to be between the members of a pair. In a common area, birds just preening or feeding, no sight of pair-bonds or sex anywhere. The earlier encounters in which the O-L-"F"-T sequence appeared, however, may well have been between the members of a pair. The same (probably) two birds had earlier been unmixed in mutual T from H, looked like FB. But none of the actual O-L-"F"-T sequences were associated with mut. T from H.

So it looks as if the T of this species can sometimes be relatively very hostile, perhaps purely hostile. Rather reminiscent of atrifrons & peruvianus.

More about voice, especially "Kow" sounds. These are very "moral" gull-type. Minutely nasal & cat-like. But lack the superimposed rattling quality of the moderate LCN's. This is true of both the L.C.N's, and the "Kow" part of the L.C., of fuliginosus. In other words, this species has not yet been heard to combine two sounds at once.



Juligmosus, October 24, 1955, III.

(18)

L.C.N.'s commonly given by flying birds. Often rapidly repeated but nothing like real L.C. Given from the usual gull postures.

Once, when a flying bird was doing slight, unritualized, swoop toward ship, it gave a series of rapidly repeated L.C.N.'s which were particularly long, perhaps quavering, perhaps particularly loud. PCC.

Must say that this species flies a lot, and gives an awful lot of aerial L.C.N.'s. Have also seen several aerial chases. It is perhaps significant, therefore, that I have seen no ritualized aerial postures or movements.

Flying birds give AlC. "Keh" or "Keh-keh" or "Ka ha". All quite Hydrocoelus-like.

Usual Alarm Posture on ground.

Juv. bird have typical gull "Kee-ah" L.C.N.'s.

One bird joins another. Probably ♀ flying in, ♂ on ground. ♂ does O (before ♀ lands) - L - "F" - T - T - U & HF - ♀ does L - "F" - T - T - U & HF - Gr. Then separate.

Adults have hood, eyebrows, white wing-stripe, like atricilla-type hooded gull, except that the white of both eyebrows and wing-stripe is much thinner.

T-T from H, with R, after attack

Bill is slightly to moderately open during Jerking Mandibles, absolutely steady, no trace of opening or closing. Then mandibles further apart during "Kee" note, again absolutely steady.



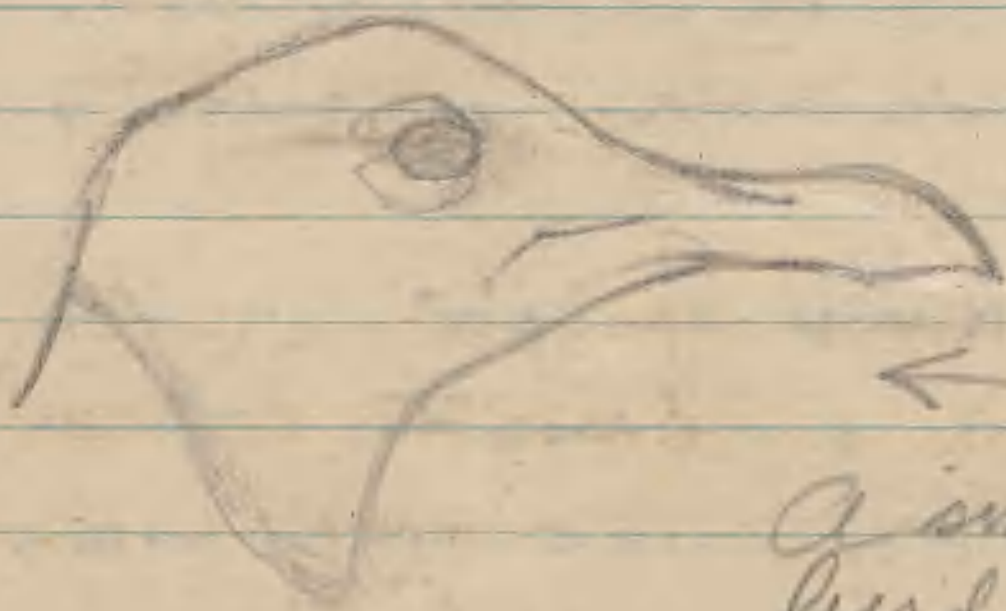
Fuliginosus

October 25  
1955

Same place 17.00 a.m.

On rocky island. Gulls, especially one pair are attacking me repeatedly.

Eye is  
definitely  
dark in these  
birds



Bill black, with spot of  
red at tip of upper  
mandible

Usual  
head-shape

A small-headed, long-bodied  
bird, looking much lighter and  
more elongate than modestus

Have seen all sorts of aerial hostility. Mostly directed  
toward me, but sometimes directed, or probably re-directed,  
toward other gulls, flying or sitting on ground. Unritualized  
hostility much like Ring-billed Gull. Attack flights. Escape  
flights. Circling, with or without up-and-down movements.  
Swoops, (usually flying, sometimes gliding) Soars, (usually  
gliding, sometimes flying) All obviously quite unritualized.

Aerial ritualized patterns are coupled to calls.  
LCN's & AlC's. No real PCC. At end of swoop, or  
end of charge, bird may give a relatively loud, almost staccato  
LCN, almost polysyllabic, but this seems to be as much re-  
miniscent of the B. G.'s "Attack Call" as of anything else.

Ad. ♀ on ground, toward flying mate O (with flicking) - L - "F" -  
T - T. This bird definitely a full adult, distinct hood. [I did  
not, yesterday, distinguish between adults & immatures. Certainly  
most of the elaborate L.C. performances were given by adults.  
but one may have been given by an immature (and the "Kow"  
LCN's of immatures are certainly like those of adults).]

Ad. ♀, apparently attempting to repel intruding imm., gave  
L.C. performance without any flicking. Began in semi-bright posture  
as if just coming out of the O, then → L - "F" - T - T